SUPPLEMENTARY SPECIFICATIONS

SECTION 201 – CLEARING AND GRUBBING

201 GENERAL

Purpose of this directive is to designate certain NYSDOT bid items for use on all City projects.

For this directive, requirements of NYSDOT Section 201 Clearing and Grubbing of *NYSDOT Standard Specifications (US Customary Units dated April 1, 2008)*, including any addenda, remains in effect.

201-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
201.06	Clearing and Grubbing	LS

REVISED August 31, 2015

SECTION 203 – EXCAVATION AND EMBANKMENT

203 GENERAL

Purpose of this directive is to designate certain NYSDOT bid items for use on all City projects.

For this directive, requirements of NYSDOT Section 203 Excavation and Embankment of *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008 confirm date)*, including any addenda, remains in effect.

203-2 MATERIALS

Under NYSDOT Section 203-2 Materials use of construction waste for Embankment or Backfill is prohibited. **DELETE** all references to permitted use of construction waste for Embankment or Backfill.

In addition to NYSDOT Section 203, Section S203, Excavation and Embankment of *City of Rochester Supplementary Specifications*, dated

203-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
203.02	Unclassified Excavation and ~~Embankment~~ — Disposal	CY
203.03	~~Compacted Subgrade~~	CY
203.25	~~Stone Bedding~~	CY

? → ok

??

* Any changes to the state spec require. It be converted to an "s" series spec.

USE 203.02 Unclassified Excavation and Disposal

and 203.03 Embankment in place

REVISED August 31, 2015

SECTION S203 - EXCAVATION AND EMBANKMENT

S203 GENERAL

DELETE Section R203 Excavation and Embankment on page S-19 in its entirety, and **REPLACE** with following:

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

Work is to be in accordance with requirements of NYSDOT Sections 203 Excavation and Embankment and 204 Controlled Low Strength Material (CLSM), with following modifications:

S203-1 DESCRIPTION

Under NYSDOT Section 203-1 Description on page 156, **DELETE** Subsection 203-1.01 Unclassified Excavation in its entirety and **REPLACE** with following:

S203-1.01 Unclassified Excavation

Estimated limits and descriptions of subsurface deposits, formations and facilities which may be shown on plans, are supplied in accordance with Paragraph 5.2.1, Article 5 Availability of Lands; Physical Conditions; Reference Points of General Terms and Conditions of City of Rochester Standard Construction Contract Documents.

At end of NYSDOT Section 203-1 Description on page 158, **ADD** following:

S203-1.18 Rock Excavation

Rock excavation consists of boulders exceeding 1/2 cubic yard in volume; and ledge rock which cannot in opinion of Project Manager, be removed without blasting or use of pneumatic hammers. Concrete pavements and pavement foundations, and sewers and their appurtenances will not be considered rock. Rock excavation for trenches or test pits will be included in Section R206 Trench and Culvert Excavation.

S203-2 MATERIALS

At end of NYSDOT Section 203-2 Materials on page 161, **ADD** following:

S203-2.05 Select Granular Backfill (Sewer/Water) - General

Select granular backfill (sewer/water) materials are to consist of sand and gravel, approved blast furnace slag, or stone, and are to be well graded from coarse to fine, and free from organic or other deleterious material.

Materials will be accepted on basis of Magnesium Sulfate Soundness Loss after 4 cycles of 20 percent or less. Plasticity index of material passing number 40 Screen is not to exceed 5.0.

Not more than 30 percent by weight of particles retained on 1/2 inch screen are to consist of flat or elongated particles. Flat or elongated particles are defined as one which has as its greatest dimension more than three times its least dimension. Acceptance for this requirement will normally be based on visual inspection by Project Manager. When City elects to test for this requirement, material which has percentage greater than allowable 30 percent will be rejected.

Materials are to meet specified gradation prior to placement, with processing completed at plant.

S203-2.06 Stone Bedding

Stone bedding material is to be crushed stone primary size type 1, or mixture of primary sizes type 1 and type 2, washed, in accordance with requirements of NYSDOT Material Section 703-02 Coarse Aggregate, material designation 703-0201.

S203-2.07 Sand

Sand material is to consist of clean, hard, durable, uncoated particles, free from lumps of clay and other deleterious substances. When dry, sand material is to be in accordance with following gradation requirements:

Screen Size	Percent Passing by Weight
1/4 inch	100%
#50	5 to 35%
#100	0 to 10%

Sand material is to have minimum resistivity of 15,000 Ohm-cm, and maximum chloride ion concentration of 50 parts per million (ppm). Sand material may be determined to be unacceptable if it contains loam or silt in excess of 10 percent of total volume.

S203-2.08 Select Granular Backfill (Sewer)

Select granular backfill (sewer) material is to be used for backfilling of trenches and excavations for catch basin, lateral pipe and other sewer related work. Select granular backfill (sewer) material is to be in accordance with following gradation requirements:

Screen Size	Percent Passing by Weight
2 inch	100%
1/4 inch	30 to 65%
#40	5 to 40%
#200	0 to 10%

S203-2.09 Select Granular Backfill (Water)

Select granular backfill (water) material is to be used for backfilling of trenches and excavations for water related work. Select granular backfill (water) material is to be in accordance with following gradation requirements:

Screen Size	Percent Passing by Weight
3 inch	100%
2 inch	90 to 100%
1/4 inch	30 to 65%
#40	5 to 40%
#200	0 to 10%

S203-2.10 Controlled Low Strength Material (CLSM)

Material and testing requirements for CLSM is to be in accordance with NYSDOT Section 204 Controlled Low Strength Material (CLSM), *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)*.

CLSM provided for use in backfilling around Water facilities, is to have a compressive strength of 50 to 100 pounds per square inch, and must not contain fly ash or other pozzolan containing materials.

S203-3 CONSTRUCTION DETAILS

At end of NYSDOT Subsection 203-3.01 General on page 161, **ADD** following:

Stockpiling of excavated material on Project site is not allowed. Excavated material is to be disposed of off site within 24 hours.

Under NYSDOT Subsection 203-3.03 Scheduling of Work to Minimize Soil Erosion and Water Pollution on page 161, **DELETE** sentence numbered 1) in paragraph 1 in its entirety and **REPLACE** with following:

1) Work is to be progressed in such manner that exposed, unprotected surface area of any earth material that is subject to erosion by wind or water, will not exceed total of 10,000 square feet at any given time. Work progression includes any special soil erosion, water and air pollution measures required in Supplementary Conditions; and:

At end of NYSDOT Section 203-3 Construction Details on page 173, **ADD** following:

S203-3.22 Select Granular Backfill, Stone Bedding, and Sand

Select granular backfill, stone bedding, and sand materials are to be placed as required in Contract Documents. Compaction is to be in accordance with requirements of NYSDOT Subsection 203-3 Construction Details.

S203-3.23 Controlled Low Strength Material (CLSM)

Construction details for CLSM is to be in accordance with NYSDOT Section 204 Controlled Low Strength Material (CLSM), *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)*.

S203-4 METHOD OF MEASUREMENT

At end of NYSDOT Section 203-4 Method of Measurement on page 174, **ADD** following:

S203-4.16 Rock Excavation

Quantity to be measured for payment will be number of cubic yards of rock excavated, as computed in original position and to payment lines as specified in Contract Documents.

S203-4.17 Stone Bedding, Sand and Select Granular Backfill (Sewer/Water)

Quantity to be measured for payment will be number of cubic yards of material satisfactorily placed and compacted, as measured in completed work within payment lines specified in Contract Documents, less measured volume for pipes that exceed 12 inches in diameter as based on nominal diameter, and for all catch basin and manhole structures.

No additional quantity will be measured for payment to make up losses due to foundation settlement, compaction, erosion or any other cause.

S203-4.18 Controlled Low Strength Material (CLSM)

Quantity to be measured for payment will be number of cubic yards of material satisfactorily placed, as measured in completed work within payment lines specified in Contract Documents or from payment lines established in writing by Project Manager, less measured volume for pipes that exceed 12 inches in diameter as based on nominal diameter, and for all other payment items when combined cross-sectional area exceeds 144 square inches, unless otherwise shown in Contract Documents. No deduction will be made for cross-sectional area of an existing facility.

No additional quantity will be measured for payment to make up losses due to foundation settlement, compaction, erosion or any other cause.

Cross sectioning, for purpose of determining quantities for payment, will be employed only where payment lines are not shown in Contract Documents, and cannot be reasonably established by Project Manager.

S203-5 BASIS OF PAYMENT

At end of NYSDOT Section 203-5 Basis of Payment on page 175, **ADD** following:

S203-5.08 Rock Excavation

Unit price bid includes cost of: excavation; disposal of excavated material; blasting; and furnishing all labor, material and equipment necessary to complete work.

S203-5.09 Stone Bedding, Sand and Select Granular Backfill (Sewer/Water)

Unit price bid includes cost of: furnishing, placing and compacting material; and furnishing all labor, material and equipment necessary to complete work.

S203-5.10 Controlled Low Strength Material (CLSM)

Unit price bid includes cost of: furnishing and placing material; and furnishing all labor, material and equipment necessary to complete work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S203.22	Rock Excavation and Disposal	Cubic Yard
S203.25	Stone Bedding	Cubic Yard
S203.26	Sand	Cubic Yard
S203.28	Select Granular Backfill (Sewer)	Cubic Yard
S203.29	Select Granular Backfill (Water)	Cubic Yard
S203.35	Controlled Low Strength Fill Material	Cubic Yard
S203.36	Controlled Low Strength Fill Material (no Fly Ash)	Cubic Yard

REVISED March 3, 2015

SECTION S206 – TRENCH AND STRUCTURE EXCAVATION

S206-1 D ESCRIPTION

Work consists of construction or alteration of drainage structures and manholes as required in Contract Documents and as directed by Project Manager.

206-1.01 General. This work shall consist of the excavation of materials and backfill or disposal of excavated material required for trenches, culverts, structures, conduit and direct burial cable not otherwise provided for in other sections of these specifications. All such excavation shall be unclassified excavation as defined in NYSDOT 203, *Excavation and Embankment.* The work shall be conducted in accordance with 29 CFR 1926 Subpart P.

206-1.02 Structure Excavation. The work specified under this item shall include the excavation for all bridge foundations, walls and other major structures and backfill of suitable excavated material if another item is not specified.

206-1.03 Trench and Culvert Excavation. The work specified under this item shall include the excavation of all materials and backfill or disposal of excavated material required for trenches, culverts, pipes, manholes, drainage structures and other minor structures, conduit and direct burial cable.

206-1.04 Conduit Excavation and Backfill including Surface Restoration. The work specified under this item shall include the excavation, necessary backfill and surface restoration required for conduits and direct burial cables.

206-1.05 Test Pits. The work specified under this item shall include the excavation and backfill of test pits at locations shown in the contract documents, or as directed by the Engineer. Excavation and backfill methods, limits and equipment used shall be approved by the Engineer. This work will not relieve the contractor of the responsibility to locate underground facilities as required under 16 NYCRR 753.

References to the NYSDOT included in this specification section refer to the *NYSDOT Standard Specifications*, latest version.

S206-2 M ATERIALS (Not Specified)

S206-3 CONSTRUCTION DETAILS

S206-3.01 General

206-3.01 General. The appropriate construction details specified in Section S203, *Excavation and Embankment* and NYSDOT 203, *Excavation and Embankment* shall apply to the work specified in this section. The excavation shall be dewatered and kept free from water, snow and ice when necessary. Special care shall be taken not to disturb the bottom of the excavation, and not to remove the material at final grade until just before the structure is placed. The provisions of NYSDOT 203-3.01D Suitable Materials and/or NYSDOT 203-3.01E Unsuitable Materials shall apply to all material excavated under this section which is not used as backfill. The Contractor shall carry out all excavation operations in a safe and prudent manner so that the workers, the public, and adjacent public and private property will be protected from unreasonable hazard in accordance with NYSDOT 107-05, *Open Excavations and Trenches*. Slopes may not be steeper than allowed by 29 CFR 1926 Subpart P. When excavation is required for the installation of conduit or direct burial cable, the Contractor shall notify the Engineer upon completion of the excavation. No conduit or cable shall be placed in the excavation until the Engineer has approved the depth and cross-section. When the Contractor, in placing conduits, direct burial cable or utilities, excavates into the pavement, subgrade, subbase, or shoulder courses, such courses must be replaced in kind, character and condition, to maintain a uniform road section, except when the Contract Documents specify that other materials shall be used.

206-3.02 Structure Excavation. The Contractor's competent person shall verify field conditions, including excavation depth, groundwater, and soil conditions with the Engineer in accordance with 29 CFR 1926 Subpart P prior to performing structure excavation for all bridge foundations, walls and other major structures. The Contractor shall backfill with suitable excavated material if a separate backfill item is not specified in the contract documents.

206-3.03 Trench and Culvert Excavation. The Contractor's competent person shall verify field conditions, including excavation depth, groundwater, and soil conditions with the Engineer in accordance with 29 CFR 1926 Subpart P prior to performing trench and culvert excavation. For utility lines, exclusive of conduit and cable lines, of less than 12 inches in diameter, the excavation width shall be the actual bottom width necessary to properly perform the installation work required, or 3 feet, whichever is less.

206-3.04 Conduit Excavation and Backfill including Surface Restoration. When the Contractor is required to excavate through portland cement concrete, asphalt concrete, composite pavement, or sidewalk, a saw cut shall be made along neat lines and to the depth as shown in the contract documents or as directed by the Engineer. Any damage to existing pavement, sidewalk, curb or other facilities caused by the Contractor's operations under this item shall be repaired by the Contractor at no additional cost to the State.

206-3.05 Test Pits. The Contractor shall excavate and backfill test pits in order to determine existing underground utility type, size and/or condition where new utility connections to existing facilities are proposed. The Contractor shall excavate and backfill test pits in a manner approved by the Engineer that prevents damage to wrappings, coatings or other protective coverings, such as by hand digging, vacuum excavation or similar non-destructive locating equipment. The limits of the excavation shall be those sufficient to determine existing utility type, size and/or condition.

S206-4 METHOD OF MEASUREMENT

206-4.01 General. The quantity of excavation will be in cubic yards, to the nearest whole cubic yard, computed from payment lines shown on the Contract Drawings. Work performed beyond any designated payment line will not be included in the computation of quantities for the item involved.

206-4.02 Structure Excavation. Vacant.

206-4.03 Trench and Culvert Excavation. Unless otherwise shown or indicated on the contract plans, payment lines for excavation of pipe and culvert lines, and minor structures will be determined as follows:

A. Bottom Payment Line. The elevation of the bottom payment line will be the invert elevation of the pipe, conduit, or culvert. For pipes, conduits, or culverts of nominal horizontal dimensions of 12 to 144 inches, the width of the excavations at the bottom payment line will be the nominal inside horizontal dimension of the pipe, conduit, or culvert plus 4 feet, or three (3) times the nominal inside horizontal dimension, whichever is less; for pipes with a nominal horizontal dimension greater than 144 inches the width will be as shown on the Contract Drawings or as specified in the Contract Documents. For concrete and smooth interior corrugated polyethylene pipe, twice the minimum wall thickness will be added to the preceding. For concrete pipe, the bottom payment line is the Bedding Control Line shown on the applicable standard sheet.

B. Top Payment Line. The top payment line will be the surface at the centerline of the pipe, culvert or conduit immediately prior to commencing trench excavation.

C. Side Payment Lines. The side payment lines of the excavation will be vertical to the bottom payment line. For utility lines, exclusive of conduit and cable lines, of less than 12 inch diameter, the excavation width will be the actual bottom width necessary, as determined by the Engineer, to properly perform the installation work required, or 3 feet, whichever is less.

D. Payment Lines for Minor Structures. Payment lines for minor structures will be vertical from the bottom

of the footing and will extend vertically from a line 2 feet from the perimeter of the structure footing. The top payment line shall be the same as for (B) above. The bottom payment line will be the bottom of footing elevation, or the bottom of undercut elevation as directed by the Engineer.

206-4.04 Conduit Excavation and Backfill including Surface Restoration. The quantity of conduit and/or cable excavation and backfill including surface restoration for payment will be the number of linear feet measured along the center of the conduit and/or cable placed, in accordance with the methods stated below. Wherever a pair or group of conduits and/or cables are physically connected together, they will be considered as a single conduit and/or cable.

A. Wherever conduit and/or cable in the same trench are physically separated laterally by 6 inches or more between centerlines, as shown on the plans or as directed by the Engineer, the linear feet measurement will be made along the center of each conduit and/or cable.

B. Wherever a pair or group of conduits and/or cable in the same trench are physically separated laterally by less than 6 inches between centerlines of adjacent conduit and/or cable, as shown on the plans or as directed by the Engineer, the linear feet measurement for those conduits and/or cable will be made along the center of that pair or group of conduit and/or cables.

206-4.05 Test Pits. The quantity to be measured for payment will be the number of test holes excavated and backfilled in accordance with the contract documents.

S206-5 BASIS OF PAYMENT

206-5.01 General. Vacant.

206-5.02 Structure Excavation. The unit price bid for this work shall include the cost of labor, materials and equipment required to satisfactorily complete the work. Payment for Sheeting, Cofferdams or Temporary Water Diversion Structures required by the plans, specifications, or ordered by the Engineer in writing will be made in accordance with the appropriate item. Where cofferdams are specified for structure excavation, the work required to keep the site free from earth, water, ice and snow shall be included in the item for cofferdams when necessary.

206-5.03 Trench and Culvert Excavation. The unit price bid for this work shall include the cost of labor, materials and equipment required to satisfactorily complete the work, including the costs of excavation, backfill (except select backfill paid for separately), disposal of excavated material, rock removal, and keeping the site dewatered and free from earth, water, ice and snow when necessary. The cost for necessary guarding to protect the public from open trenches, and that required for the protection to ensure the safety of the workers, and for any necessary excavation support shall be included in other items. Progress payments will be made after the excavation has been completed, and prior to the completion of other work included under this item, including but not limited to pumping and backfilling. Payment will be made, at the unit price bid, for 75% of the quantity excavated within the prescribed payment lines. The balance of the quantity excavated will be paid for upon proper completion of backfill placement. No extra payment will be made for the cost of any materials excavated or placed outside the payment lines shown on the plans or as described in this specification. No extra payment will be made for excavation protection or support systems not shown in the contract plans, unless use of such systems is directed by the Engineer. With exception of the Conduit Excavation and Backfill including Surface Restoration item, the work of replacing pavement, subcourses and shoulder courses will be paid for and performed under the provisions of their respective items and subsections.

206-5.04 Conduit Excavation and Backfill including Surface Restoration. The unit price bid for this work shall include the cost of furnishing all labor, materials and equipment necessary to satisfactorily excavate and backfill the trench, including sawcutting, and to restore and replace any pavement, shoulder, and sidewalk courses, subcourses, curbs, drives, lawns and other top surfaces as required to complete the work.

206-5.05 Test Pits. The unit price bid for this work shall include the cost of furnishing all labor, materials and equipment necessary to satisfactorily excavate and backfill the test pit and replace any pavement, shoulder and

sidewalk courses, subcourses, curbs, drives, lawns and other top surfaces required to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
206.01	Structure Excavation	Cubic Yard
206.0201	Trench and Culvert Excavation	Cubic Yard
206.03	Conduit Excavation and Backfill including Surface Restoration	Foot
206.05	Test Pit Excavation	Each

SECTION 207 – GEOTEXTILE FABRIC

207 GENERAL

Purpose of this directive is to designate certain NYSDOT bid items for use on all City projects.

For this directive, requirements of NYSDOT Section 207 Geotextile Fabric of *NYSDOT Standard Specifications (US Customary Units dated August 19, 2014)*, including any addenda, remains in effect.

207-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
207.21	Geotextile Separation at Porous Pavement	SY

REVISED August 31, 2015

SECTION S207 – GEOTEXTILES AND GEOGRIDS

S207-1 DESCRIPTION

Work consists of installation of geotextile and geogrid materials as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

S207-2 MATERIALS

S207-2.01 Pavement Crack and Joint Repair

Polyester fiber fabric is to be heavy-duty, high strength, heat bonded geotextile composite membrane specifically fabricated for use to repair and waterproof pavement cracks and joints.

Polyester fiber fabric is to meet following properties:

Property	Test Method	Value
Mastic Density	ASTM D70	80 pound/cubic foot
Weight	-	0.80 pound/square foot
Thickness	ASTM D1777	0.135 inches
Absorption	ASTM D517	1% maximum
Brittleness	ASTM D517	Pass
Mastic Softening Point	ASTM D36	210°F minimum
Cold Flexibility	ASTM D146 (modified)	pass at 200°F
Heat Stability	2 inch x 5 inch specimen hung vertically for 2 hours at 190°F	no dripping or delamination
Puncture Resistance	ASTM D154	450 pounds minimum
Elongation	ASTM D412, Die C	20% minimum
Tensile Strength	ASTM D412, Die C	2000 pound/square inch minimum

S207-2.02 Pavement Reinforcement

Pavement reinforcement material is to be either biaxial or triaxial geogrid.

Biaxial geogrid is to be punched and drawn from polypropylene sheet specifically fabricated for use as pavement reinforcement, and has high tensile strength in two directions, perpendicular to each other. Biaxial geogrid is to be as manufactured by Tensar, or any biaxial material listed on *NYSDOT Technical Services-Materials-Approved List*, or approved equivalent.

Triaxial geogrid is to be punched and drawn from polypropylene sheet specifically fabricated for use as pavement reinforcement, and is oriented in three substantially equilateral directions, with ribs having high degree of molecular orientation which continues in part through mass of integral node. Triaxial geogrid is to be TriAx TX5 or TriAx TX7 as manufactured by Tensar, or any triaxial material listed on *NYSDOT Technical Services-Materials-Approved List*, or approved equivalent.

TriAx TX5 is to be used for light and medium duty asphalt pavement sections, TriAx TX7 for modified and heavy duty asphalt pavement sections.

S207-2.03 Pavement Undercut Stabilization

Pavement undercut stabilization material is to be either triaxial geogrid or polypropylene geotextile.

Triaxial geogrid is to be punched and drawn from polypropylene sheet specifically fabricated for use as pavement undercut stabilization, and is oriented in three substantially equilateral directions, with ribs having high degree of molecular orientation which continues in part through mass of integral node. Triaxial geogrid is to be TriAx TX160 as manufactured by Tensar, or any triaxial material listed on *NYSDOT Technical Services-Materials-Approved List*, or approved equivalent.

Polypropylene geotextile is to be composed of high-tenacity polypropylene yarns specifically fabricated for use as pavement undercut stabilization, and is woven into stable network such that yarns retain their relative position. Polypropylene geotextile is to be Mirafi 500X as manufactured by TenCate, or any geotextile material listed on *NYSDOT Technical Services-Materials-Approved List*, or approved equivalent.

S207-2.04 Subsurface Drainage

Geotextile fabric for subsurface drainage is to be 100 per cent staple polyester and polypropylene non-woven needle-punched geotextile fabric designed for long-term passage of water into subsurface drain system, as per AEF 480HS as manufactured by American Engineering Fabrics Inc., FX-40HS as manufactured by Carthage Mills, 140NC as manufactured by Mirafi/TenCate, or approved equivalent.

Geotextile fabric for subsurface drainage is to meet following minimum average roll values:

Property	Test Method	Value
Thickness	ASTM D1777	60 mils
Tensile Strength	ASTM D4632	80 pounds
Elongation @ break	ASTM D4632	50%
Trapezoidal Tear	ASTM D-4533	30 pounds
Apparent Opening Size	ASTM D-4751	60 sieve maximum
Permittivity	ASTM D-4491	2.00 Sec-1
Water Flow Rate	ASTM D-4491	140 gallons/minute/square foot
UV Resistance @ 500 hours	ASTM D-4355	70%

S207-2.05 Tack Coat

Tack coat is to be diluted or straight tack coat mix in accordance with Section S407 Tack Coat.

S207-3 CONSTRUCTION DETAILS

S207-3.01 General

Materials are to be protected from exposure to sunlight during transport and storage.

Materials are to be installed in accordance with manufacturer's latest instructions and as approved by Project Manager. After placement, material is not to be left uncovered for more than one week.

Traffic or construction equipment is not permitted to be directly on material.

Material which becomes torn or damaged due to Contractor's operations is to be replaced or patched at Contractor's expense. Patch is to extend 3 feet beyond perimeter of tear or damage.

S207-3.02 Pavement Crack and Joint Repair

Pavement surface upon which fabric is to be placed is to be cleaned and kept cleaned of all extraneous materials. Cracks that are larger than 1-1/4 inch in width, and all holes, are to be thoroughly cleaned of all dirt and loose material, and filled with an acceptable asphalt concrete material.

Tack coat is to be applied uniformly by either power spray units or pour pots. It is important when applying tack coat to remember that edges of fabric are to be well bonded to pavement surface.

In warm weather conditions (60°F and rising), tack coat is to be applied at rate of 0.10 gallons per square yard. In cold weather conditions (45°F and rising), tack coat is to be applied at rate of 0.10 to 0.20 gallons per square yard. In no case is rate of application to exceed 0.20 gallons per square yard.

Width of tack coat application on pavement surface is width of fabric plus 2 to 3 inches. Tack coat is not to be applied no further in advance of fabric placement, than what can be accomplished without losing adhesive abilities of tack coat. In cold weather, advance application distance is to be no more than 5 feet.

In certain applications high solids emulsion may be used as tack coat, but caution must be exercised to let emulsion break prior to embedment of fabric. When using an emulsion tack, overspray area must not exceed 2 inches.

Where transverse and longitudinal joints meet, fabric may be butted or overlapped. Overlapping is mandatory on bridge decks, or where intentional waterproofing is desired. Where overlapping is used, additional tack coat is required to bond two fabric areas together.

Prior to applying asphalt overlay, small amounts of washed sand may be used to blot excess asphalt to facilitate movement of traffic or construction equipment over fabric. If fabric sticks to paver or truck tire, hot mix asphalt can be sanded out on fabric ahead of paver. Hot mix asphalt overlay may be placed immediately after placement of fabric.

S207-3.03 Pavement Reinforcement and Undercut Stabilization

Subgrade is to be finish graded before placement of material.

If tensioning or joining methods are not employed, subbase course material can be back dumped from trucks riding on top of material. Subbase course material is to be bladed onto material in such manner that subbase course material rolls ahead onto geotextile.

If ruts are created in subbase course fill due to construction traffic, fill ruts with additional subbase course material, do not blade adjacent subbase course material into rut.

Rip-rap or stone filling is not to be dropped onto geotextile material from heights that are greater than 12 inches.

Overall undercut section will be to eliminate soft or otherwise undesirable subgrade material, to depth AOBPM.

S207-3.04 Subsurface Drainage

Geotextile fabric for subsurface drainage is to be placed to conform loosely to shape of trench, and folded over top of filter material to produce minimum overlap of 12 inches.

S207-4 METHOD OF MEASUREMENT

S207-4.01 Pavement Crack and Joint Repair; Pavement Reinforcement and Undercut Stabilization

Quantity to be measured for payment will be number of square yards of material installed as computed from payment limits shown on plans.

Measurement and separate payment is not to be made for material that is used for overlaps, seams, patches or repairs.

S207-4.02 Subsurface Drainage

Quantity to be measured for payment will be number of square yards of material installed as computed from payment limits shown on plans, including overlap.

S207-5 BASIS OF PAYMENT

S207-5.01 General

Unit price bid for all items includes cost of: furnishing, storing, installing, cutting, seams, overlapping and joining material; and furnishing all labor, material and equipment necessary to complete work.

S207-5.02 Pavement Crack and Joint Repair

Unit price bid also includes cost of: furnishing and placing asphaltic materials; crack-filler; tack coat; cleaning, repairing, filling joints and cracks.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S207.10	Pavement Crack and Joint Repair	Square Foot
S207.11	Pavement Reinforcement – Biaxial Geogrid	Square Yard
S207.12	Pavement Reinforcement – Triaxial Geogrid for Light and Medium Duty Asphalt Pavement	Square Yard
S207.13	Pavement Reinforcement – Triaxial Geogrid for Modified and Heavy-Duty Asphalt Pavement	Square Yard
S207.14	Pavement Undercut Stabilization – Triaxial Geogrid	Square Yard
S207.15	Pavement Undercut Stabilization – Polypropylene Geotextile	Square Yard
S207.16	Subsurface Drainage	Square Yard

REVISED October 31, 2014

SECTION 209 – SOIL EROSION AND SEDIMENT CONTROL

209 GENERAL

Purpose of this directive is to designate certain NYSDOT bid items for use on all City projects.

For this directive, requirements of NYSDOT Section 209 Soil Erosion and Sediment Control of *NYSDOT Standard Specifications (US Customary Units dated April 1, 2008)*, including any addenda, remains in effect.

209-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
209.110302	Check Dam (Ditch Bottom Width >3'-6") Sand Bag, Temporary	EA
209.1904	Rolled Erosion Control Product, Class II, Type D, Int. Biodegradable	SY
209.2004	Rolled Erosion Control Product, Class II, Type D, Int. Biodegradable	SY

REVISED August 31, 2015

SECTION S209 – SOIL EROSION AND SEDIMENT CONTROL

S209 GENERAL

Work is to be in accordance with requirements of NYSDOT Section 209 Soil Erosion and Sediment Control, with following modifications:

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

S209-4 METHOD OF MEASUREMENT

Under NYSDOT Section 209-4 Method of Measurement, **DELETE** Subsections 209-4.01 Temporary Mulch, 209-4.02 Temporary Seed and Mulch, 209-4.04 Temporary Strawbale, 209-4.05 Temporary Silt Fence, 209-4.09 Drainage Structure Inlet Protection and 209-4.11 Construction Entrances in their entirety and **REPLACE** with following:

S209-4.01 Temporary Seed or Mulch

Quantity to be measured for payment will be number of square feet of area temporarily mulched or seeded, to nearest square foot.

S209-4.02 Temporary Seed and Mulch

Quantity to be measured for payment will be number of square feet of area temporarily seeded and mulched, to nearest square foot.

S209-4.04 Temporary Straw Bale

Quantity to be measured for payment will be number of linear feet of straw bale dike constructed as measured along face of dike, to nearest foot.

S209-4.05 Temporary Silt Fence

Quantity to be measured for payment will be number of linear feet of silt fence dike constructed as measured along face of dike, to nearest foot. No measurement will be made for seams or overlaps.

S209-4.09 Drainage Structure Inlet Protection

Quantity to be measured for payment will be number of drainage structure inlet protected, regardless of height of gravel bag dike.

S209-4.11 Construction Entrances

Quantity to be measured for payment will be number of square feet of construction entrances constructed, to nearest square foot. No measurement will be made construction entrances associated with Contractor's operations.

S209-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S209.30	Mulch - Temporary	Square Feet
S209.31	Seed - Temporary	Square Feet

ITEM NO.	ITEM	PAY UNIT
S209.32	Seed and Mulch - Temporary	Square Feet
S209.22	Straw Bale - Temporary	Linear Feet
S209.34	Silt Fence - Temporary	Linear Feet
S209.35	Drainage Structure Inlet Protection, Silt Fence - Temporary	Each
S209.36	Drainage Structure Inlet Protection, Gravel Bag - Temporary	Each
S209.37	Drainage Structure Inlet Protection, Prefabricated - Temporary	Each
S209.38	Drainage Structure Inlet Protection, Concrete Block - Temporary	Each
S209.39	Construction Entrance	Square Feet

SECTION 304 – SUBBASE COURSE

304 GENERAL

Purpose of this directive is to designate certain NYSDOT bid items for use on all City projects.

For this directive, requirements of NYSDOT Section 304 Subbase Course of *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)*, including any addenda, remains in effect.

304-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
304.11	Subbase Course Type 1	CY
304.12	Subbase Course Type 2	CY

REVISED August 31, 2015

SECTION 402 - HOT MIX ASPHALT (HMA) PAVEMENTS

402 GENERAL

Purpose of this directive is to designate certain NYSDOT bid items for use on all City projects.

For this directive, requirements of NYSDOT Section 402 Hot Mix Asphalt (HMA) Pavements of *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)*, including any addenda, remains in effect.

402-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
402.018902	True & Leveling F9, Superpave HMA, 80 Series Compaction	Ton
402.098202	9.5 F2 Top Course HMA, 80 Series Compaction	Ton
402.198902	19 F9 Binder Course HMA, 80 Series Compaction	Ton
402.378902	37.5 F9 Base Course HMA, 80 Series Compaction	Ton

REVISED May 1, 2013

SECTION S407 – TACK COAT

S407-1 DESCRIPTION

Work consists of preparing and treating portland cement concrete and hot mix asphalt (HMA) surfaces with tack coat as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

S407-2 MATERIALS

Tack coat is to meet requirements of NYSDOT Section 702 Bituminous Materials for following emulsion grades:

Asphalt Emulsion – Diluted Tack Coat	702-3401
Asphalt Emulsion – Straight Tack Coat	702-3002

S407-3 CONSTRUCTION DETAILS

S407-3.01 General

Diluted tack coat is to be used for conventional hot mix asphalt (HMA) pavements, and is to be applied between all lifts of HMA courses. Diluted tack coat is to be applied on top of milled pavement surface, and on top of concrete base.

Straight tack coat may be used for conventional hot mix asphalt (HMA) pavement overlay, only if existing pavement is not milled. Straight tack coat may also be used on steeper graded pavements, for nighttime paving operations, or for late season paving.

S407-3.02 Equipment

Distributor is to be designed, equipped, maintained and operated so that tack coat can be heated and applied uniformly at readily determined and controlled rates and with uniform pressure, on pavement surfaces of variable widths, up to 15 feet wide.

Distributor equipment is to include quantity measuring system and thermometer for measuring temperature of tank contents. Prior to being used, equipment is to be calibrated in accordance with ASTM D 2995 Standard Practice for Estimating Application Rate of Bituminous Distributors, or any other equivalent calibration procedure acceptable to Project Manager. Project Manager will witness equipment calibration, or require Contractor to provide documentation certifying calibration.

Distributor is to be equipped with power unit for pump, and circulation spray bars which are adjustable both laterally and vertically. Bristle broom that drags on pavement behind spray bars may be attached to distributor, and is adjustable both laterally and vertically so that full width of tack coat being applied is bristled uniformly onto pavement surface.

Distributor is to be equipped with bituminous material sampling valve attached to distributor. When samples are taken through sampling valve, samples will be considered representative of all material in tank.

Distributor tank is to be equipped with an agitator that is capable of ensuring tack coat remains homogeneous, and that tack coat stored in distributor tank is heated and maintained at temperature of between 85°F and 160°F.

Hand operated spray units will be permitted only in areas where use of distributor is impractical.

S407-3.03 Application

Tack coat is to be uniformly applied across width of designated area by pressure distributor onto prepared clean pavement surface.

Tack coat is to be applied to offer least inconvenience to traffic and to permit one-way traffic where practical, to prevent pickup or tracking of tack coat material.

Tack coat is not to be applied on wet pavement surface, or when pavement surface temperature is below 40°F.

Recommended application rate in gallons per square yard is:

Surface Type	Application Rate (gallons per square yards)	
	Diluted Tack Coat	Straight Tack Coat
New Hot Mix Asphalt (HMA)	0.05 – 0.06	0.03 – 0.04
Milled Surface and Existing Hot Mix Asphalt (HMA)	0.08 – 0.10	0.05 – 0.06
Portland Cement Concrete	0.08 – 0.10	0.05 – 0.06
Vertical Surfaces (curbs, drainage structures, miscellaneous appurtenances)	0.09 – 0.11	0.06 – 0.07

These are recommended application rates for tack coat on various surface types and may be modified as approved of by Project Manager.

S407-4 METHOD OF MEASUREMENT

Quantity to be measured for payment will be number of square yards of pavement surface treated, or number of gallons of tack coat applied. Number of gallons of tack coat will be as measured at 60°F to nearest gallon.

S407-5 BASIS OF PAYMENT

Unit price bid includes cost of: preparation of pavement surface; furnishing and applying tack coat; and furnishing all labor, material and equipment necessary to complete work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S407.0201	Diluted Tack Coat	Square Yard
S407.0202	Straight Tack Coat	Square Yard
S407.0301	Diluted Tack Coat	Gallon
S407.0302	Straight Tack Coat	Gallon

REVISED May 1, 2013

SECTION 420 – POROUS ASPHALT PAVEMENT

420 GENERAL

Purpose of this directive is to designate certain NYSDOT bid items for use on all City projects.

For this directive, requirements of NYSDOT Section 420 Top Course Porous Asphalt Pavement of *NYSDOT Standard Specifications (US Customary Units dated November 14, 2014)*, including any addenda, remains in effect.

420-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
	TOP COURSE POROUS ASPHALT PAVEMENT W/MINERAL FIBER F3	TON!
420.10130201	Porous Pavement Top Course ~~with Fiber F3~~	~~SF~~
420.10190201	~~Choker Course~~ TOP COURSE ASPHALT PAVT W/MINERAL FIBER F9	~~CF~~ TON
420.0~~8~~190201	~~Filter and Pea Gravel Courses~~	~~CF~~ TON

420.01190201 BINDER COURSE POROUS ASPHALT PAVEMENT F9

REVISED August 31, 2015 LAC- addition date

SECTION 597 – PEDESTRIAN BRIDGE

S597-1 DESCRIPTION

Work consists of installation of prefabricated wood bridge as required in Contract Documents and as directed by Project Manager.

Substructures shall be construction in accordance with these Contract Documents and Section *S504, Portland Cement Concrete.*

For purposes of this specification, all references are in accordance with the following: National Design Specifications for Wood Construction (NFPA), the American Institute of Timber Construction Manual (AITM), American Association of State Highway and Transportation Officials (AASHTO) Design Specifications for Highway Bridges and the American Wood Protection Association (AWPA) Standards.

S597-2 MATERIALS

S597-2.01 General

Bridge shall be pre-engineered and pre-fabricated bridge. single span, thirty (30) feet long measured from ~~end~~ to ~~end of deck~~, with clear width of eight (8) feet, measured between inside faces of railing. Total rail height shall measure at least three (3) feet ~~six (6)~~ inches, measured above deck surface.

Wood shall be kiln dried and pressure treated Southern Yellow Pine. All components except decking, including posts, stringers and diaphragm beams shall be glue-laminated. Appearance grade shall be industrial. All visible pieces of lumber and timber having knots would be visible are not permitted. Cluster knots and knots in groups are not permitted. Only pieces of sound wood, free from any form of decay shall be used. No piece of exceptionally lightweight shall be used.

Solid sawn timber members shall conform to the requirements of the grading rules of the agency for the species, type and grade specified. Glued-Laminated members shall have the trademarks of a third party inspection agency recognized by the International Accreditation Service, Inc. for the combination, species, use and appearance as specified. A Grading Agency Certification is required on all timber material.

Preservative treatment of lumber shall be by the pressure process with Copper Naphthenate. Pressure treatment shall be in accordance with AWPA Standards and AASHTO designations. To the extent possible, all adazing, boring, chamfering, framing, gaining, mortising, surfacing and general framing shall be done prior to treatment. All cut surfaces done after treatment shall be coated according to AWPA standards.

All hardware shall be hot dipped galvanized steel. Except where a dome head bolt is used, all bolt heads or tightening nuts shall have a washer of sufficient thickness and bearing area to ensure a minimum deformation of the contact surface when tightened.

S597-2.02 – Subbase Course

Subbase course is to be subbase course type 1 and type 2 in accordance with NYSDOT Section 304 Subbase Course.

S597-2.03 – Concrete Foundation

Concrete foundation to conform to S504 – Portland Cement Concrete – Class K.

S597-2.04 – Reinforcing

Reinforcing to conform to NYSDOT Specification 556

S597-3 CONSTRUCTION DETAILS

S597-3.01 General

Bridge shall include the following wood members: stringers, diaphragms, continuous interior stringers, ledgers, decking, posts and handrails. Size of the stringers and spacing of the diaphragms shall be as per the manufacturer's requirements for the size bridge specified. Lumber shall conform to the dimensions specified for either rough or surfaced stock.

All lumber and timber shall be straight, well sawed, sawed squared at ends and have opposite surfaces parallel unless otherwise required.

Nails and spikes shall be driven with sufficient force to set the heads flush with the surface of the wood, ensuring the surface is free from deep or frequent hammer marks. Pre-drilling of holes for screws, nails, spikes, lags or bolts shall be required as necessary to eliminate splitting of timber.

Design shall be based on 85 PSF live load, 12 PSF wind load with the deflection limitation L/300 for live load. Railing to be designed to 50 plf or 200lb point load in any direction.

Bridge design shall include a curved camber structure, curved to a camber of 6-8%.

Decking shall include transverse deck planks.

Rail design shall include two horizontal rails, curved to match camber at the deck.

4" min opening * per State Code

Available manufacturers may include, but are not limited to the following:

1. Cedar Forest Products, 1008 South Division, Polo, IL, (800) 552-9495.
2. Wheeler Consolidated, 9330 James Avenue S., Bloomington, MN, (800) 328-3986.
3. Western Wood Structures, 20675 105th Ave., Tualatin, OR, (503) 692-6434.
4. EnWood Structures, 10224 Durant Road, Raleigh, NC (800) 777 8648.
5. Or Equal.

Contractor shall provide bridge plan and details conforming to all required codes and standards, sealed by a NYS professional engineer prior as part of the submittal process.

Contractor shall inspect bridge supports and confirm supports are complete and ready for bridge installation prior to start of installation operations. Contractor shall handle bridge in conformance with manufacturer's recommendation to avoid damage, scratching or penetration of the bridge. Install bridge in conformance with the manufacturer's written specifications and assembly instructions. Following installation of pre-fabricated structure, install any other components per manufacturer's written specifications.

Bridge manufacturer shall provide a warranty for materials free from manufacturing defects for a period of ten years from the date of invoice.

S597-4 METHOD OF PAYMENT

S597-4.01 Item

Quantity to be measured for payment will be lump sum price for the bridge.

S597-5 BASIS OF PAYMENT

S597-5.01 General

Lump Sum price bid includes cost of furnishing and construction of pedestrian bridge including all excavation, subbase, concrete, and pre-fabricated bridge components as outlined on contract documents.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S 597.01	Pedestrian Bridge	Each

CREATED June 9, 2015 Update to

SECTION R601 – SEWER LATERAL AND CONNECTION

601 GENERAL

Purpose of this directive is to designate certain City of Rochester bid items for use on all City projects.

For this directive, requirements of City of Rochester Section 601 Sewer Lateral and Connection of *Standard Construction Contract Documents dated November 1, 1991)*, including any addenda, remains in effect.

601-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R601.07	Lateral Connection to Existing Catch Basin	EA

REVISED August 31, 2015

SECTION C603 – SEWER PIPE

603 GENERAL

Purpose of this directive is to designate certain New York State Department of Transportation bid items for use on all City projects.

For this directive, requirements of Monroe County Section 603 Sewer Pipe of *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)*, including any addenda, remains in effect.

603-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C603.992108	Polyvinyl Chloride Pipe Lateral, SDR21, 8" Diameter	LF
C603.990808	Polyvinyl Chloride Pipe Lateral, SDR35, 8" Diameter	LF
C603.990812	Polyvinyl Chloride Pipe Lateral, SDR35, 12" Diameter	LF
C603.990815	Polyvinyl Chloride Pipe Lateral, SDR35, 15" Diameter	LF
C603.990818	Polyvinyl Chloride Pipe Lateral, SDR35, 18" Diameter	LF

REVISED August 31, 2015

SECTION S604 - CATCH BASIN AND SEWER MANHOLE

S604-1 DESCRIPTION

Work consists of construction, modification or repair of catch basin/field inlet structures; and adjustment or replacement of sewer manhole frame and cover as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

S604-2 MATERIALS

S604-2.01 General

Bar reinforcement is to be in accordance with NYSDOT Section 709-01 Bar Reinforcement, Grade 60.

Brick is to be first quality, sound, hard-burned common sewer brick, culled of all irregular, unsound or damaged brick, in accordance with ASTM Designation C32 grade SS.

Dampproofing material for exterior portion of catch basin, field inlet and sewer manhole structures is to be two coats of Hi-Build Bituminous Coating 35-J-10 as manufactured by Mobil Corporation, or Koppers Bitumastic Super Service Black as manufactured by Koppers Company, Inc, or approved equivalent.

Dampproofing material for interior portion of catch basin/field inlet structures is to be two coats of Tamms Duralkote 240 as manufactured by Dural International Corporation, or approved equivalent.

Dampproofing material for interior portion of sewer manhole adjustment courses is to be one coat of Tamms Duralkote 500 as manufactured by Dural International Corporation, or approved equivalent.

Grout is to be non-shrink type grout with minimum compressive strength of 4000 psi at 24 hours in accordance with NYSDOT Section 701-05 Concrete Grouting Material.

Joint compound is to be Mainstay Joint Compound, Sikaflex-1A, Sonolastic NPII as manufactured by Sonneborn, or approved equivalent.

Portland cement mortar is to be in accordance with ASTM Designation C270, Type M, mortar for unit masonry.

Portland cement mortar for plugging abandoned lateral pipe is to be regular cement mortar, type II cement.

Material for backfilling around catch basin, field inlet and sewer manhole structures is to be select granular backfill (sewer) in accordance with Section S203 Excavation and Embankment.

Material for leveling course under catch basin/field inlet structures is to be stone bedding in accordance with Section S203 Excavation and Embankment.

S604-2.02 Catch Basin/Field Inlet - General

Concrete to be used for construction, modification or repair of catch basin/field inlet structures is to be class A concrete in accordance with NYSDOT Section 555 Structural Concrete.

Precast concrete section of catch basin/field inlet structures is to be constructed in accordance with NYSDOT Section 706-04 Precast Concrete Drainage Units.

Catch basin/field inlet unit is to be supplied complete with frame and grate.

S604-2.03 Type A and Type B Catch Basin

Type A and Type B catch basin frame and grate are to be fabricated steel in accordance with Section R655 Frame and Grate.

S604-2.04 Type A and Type B Catch Basin (Furnished)

Monroe County Pure Waters (MCPW) will furnish precast section of catch basin structure, and frame and grate. Furnished materials are to be picked-up from MCPW Stockroom, 444 East Henrietta Road, Rochester, New York, Monday through Friday, between hours of 8:00AM and 3:00PM, (585) 753-7574. MCPW Stockroom requires minimum of 2 working days advance notice to make arrangements for pick-up of furnished materials.

S604-2.05 Type C Catch Basin

Type C catch basin is to be cast-in-place concrete structure, with frame and grate, trap and underdrain check valve.

Catch basin frame and grate is to be per Syracuse pattern NYSDOT No.9 as manufactured by Syracuse Castings, or approved equivalent.

Catch basin trap is to be cast iron hooded type per Neenah R-3701-8 as manufactured by Neenah Foundry Company, or tee wye with threaded clean-out plug on top side.

Underdrain check valve is to be capable of preventing water from backing up into underdrain pipe.

S604-2.06 Type D Catch Basin

Type D catch basin is to be Type B catch basin structure, frame and grate; with additional access frame and cover.

Access frame is to be welded steel, and access cover 1/4 inch diamond plate, rib reinforced hot rolled steel, hot dipped galvanized, in accordance with ASTM A36, ASTM A48-83 Class 30B, and ASTM 123.

S604-2.07 Field Inlet

Field inlet is to be cast-in-place Type A catch basin structure, with concave shaped frame and grate.

Frame and grate is to be heavy duty cast iron type per Neenah R-3205 as manufactured by Neenah Foundry Company, or approved equivalent.

S604-2.08 Sewer Manhole Frame and Cover

A. General

Concrete for adjustment or replacement of sewer manhole frame and cover is to be class K concrete in accordance with Section S504 Portland Cement Concrete.

B. Sewer Manhole Frame and Cover

Castings are to be gray iron in accordance with ASTM A48-83 and AASHTO M105-82, with minimum tensile strength of 30,000 psi, (Class 30B). Castings are to be rated heavy-duty designed for AASHTO HS-20-44 highway loading plus 30 percent impact. As-cast dimensional tolerances are not to exceed ± 1/16 inch per foot.

Standard manhole covers are to be heavy-duty 1-3/8 inch thick, 24 inch diameter, with 22-1/2 inch clear opening, per Syracuse pattern 1032.

Watertight outer manhole covers are to be heavy-duty 1-1/2 inch thick, 30 inch diameter, with 24 inch clear opening on inner cover, 1/4 inch thick gasket, and inner cover bolt and lock bar, per Syracuse pattern 6544.

C. Sewer Manhole Frame and Cover (Furnished)

Monroe County Pure Waters (MCPW) will furnish replacement sewer manhole and cover. Furnished materials are to be picked-up from MCPW Fleet Center, 145 Paul Road, Chili, New York, Monday through Friday, between hours of 8:00AM and 3:00PM, (585) 753-7626. MCPW Fleet Center requires minimum of 2 working days advance notice to make arrangements for pick-up of furnished materials.

S604-3 CONSTRUCTION DETAILS

S604-3.01 General

Manufacturer's shop drawings are to be submitted to City for approval as required in General Conditions Article 6, Section 6.13 Shop Drawings and Samples.

Construct all new sewer main and lateral pipes, catch basins/field inlets, sewer manholes, and any other related appurtenances in accordance with requirements of Rochester Pure Waters District (RPWD).

If requested, RPWD personnel will locate and mark existing sewer laterals. RPWD personnel can only mark location of existing wye branches at sewer main, and cannot verify where existing lateral pipe extends from there. Request lateral stakeout by contacting MCPW Maps and Records, (585) 753-7367 or (585) 753-7651.

Existing sewer manhole frames and covers, and catch basin/field inlet frames, grates, access covers and capstones are property of RPWD. All such appurtenances that are removed are to be cleaned of all extraneous material and returned to MCPW Fleet Center, 145 Paul Road, Rochester, New York, Monday through Friday, between hours of 8:00AM and 3:00PM, inquire at main gate.

Appropriate measures are to be taken to prevent any damage to, or dirt, debris, construction materials, and any other extraneous materials from entering existing sewer system including but not limited to sewer main, lateral and underdrain pipes, catch basins/field inlets, sewer manholes, junction chambers, and any other related appurtenances during construction of Project. Any such invasive materials are to be removed immediately and contaminated appurtenance thoroughly cleaned.

RPWD must be notified immediately in event of any damage to existing sewer pipes and appurtenances, by calling (585) 753-7351, or (585) 753-7676. All repairs are to be performed in presence of representative of RPWD and are to be made in accordance with requirements of RPWD.

Excavation is to be performed in accordance with requirements of Section R206 Trench and Culvert Excavation.

Stone bedding leveling course and select granular backfill (sewer) materials are to be placed in accordance with requirements of Section S203 Excavation and Embankment. No structure is to be backfilled until mortar has completely set.

Sewer manhole frame and cover, catch basin/field inlet frame and grate, and catch basin access frame and cover are to be placed true to line and grade. Suitable measures are to be taken to ensure that cover/grate has continuous, full and uniform bearing contact with corresponding frame. Cover/grate is to be non-rocking when in place and under influence of traffic or other loads. Suitable methods to achieve non-rocking fit between cover/grate and corresponding frame will include, but not be limited to, following:

- ground mating surfaces
- machined and milled mating surfaces (horizontal and vertical)
- match marked elements
- locking elements

If match marked elements are utilized, care is to be taken to retain identity of elements in order to correctly match them and assure proper fit.

Field repairs may include grinding or proper welding techniques for material involved. Repairs that involve welding will be allowed only on steel castings and only with prior approval of Project Manager. Repairs are to result in complete unit whose individual parts have continuous, full and uniform bearing contact with each other, and that cover/grate does not rock or move under influence of traffic or other loads.

Catch basin/field inlet grate and catch basin access cover are to be bolted down to respective frame making sure that all bolts are completely tightened and unable to be loosened by hand.

Upon completion of work, sewer manhole and catch basin/field inlet structures are to be thoroughly dampproofed, cleaned of all extraneous material and kept clean until final acceptance of work.

S604-3.02 Catch Basin/Field Inlet

Prior to ordering precast portion of new catch basin/field inlet structure, verify proposed invert elevation, and size and direction of all lateral and underdrain pipes.

Where existing lateral pipe is to be reconnected to new catch basin/field inlet, existing lateral pipe is to be thoroughly cleaned of all extraneous material before making connection.

Lateral and underdrain pipe connections to catch basin/field inlet structure are to be made flush with inside face of structure and are to project outside of structure sufficient distance to allow for proper connection with adjoining lateral and underdrain pipe sections. Lateral and underdrain pipes are to fit neatly and tightly within structure wall, and connections are to be thoroughly sealed with epoxy grout and mortar.

Apply two coats of appropriate dampproof material to all exterior and interior surfaces of catch basin/field inlet structure, making sure that all surfaces are thoroughly covered.

S604-3.03 Adjust Existing Catch Basin/Field Inlet Frame and Grate, Access Frame and Cover

Existing catch basin/field inlet frame and grate, and if required access frame and cover, is to be removed and cleaned of all extraneous material. Any portion of existing structure walls that are damaged are to be repaired consistent with original construction.

Scarify or otherwise remove as necessary top portion of existing catch basin/field inlet structure walls to sufficient depth to accommodate new minimum 12 inch concrete cap. Prior to forming and pouring new concrete cap, top surface of existing structure walls are to be coated with epoxy polysulfide grout meeting requirements of NYSDOT Material designation 721-03 Epoxy Polysulfide Grout. Number 5 rebar is to be installed to tie-in new concrete cap with existing structure walls, extending minimum of 6 inches into both new concrete cap and existing structure walls. Drill holes into existing structure walls to install rebar, grout in rebar to form tight fit. Install existing or new frame and grate.

Apply two coats of appropriate dampproof material to all new exterior and interior concrete surfaces of catch basin/field inlet structure, making sure that all surfaces are thoroughly covered.

S604-3.04 Modify Existing Capstone Catch Basin

Existing capstone catch basin structure walls are generally constructed of brick and mortar, with portion of structure being located under and behind curb line. Portion of existing structure located behind curb is generally topped off with medina capstone.

Existing capstone catch basin frame and grate are to be removed and cleaned of all extraneous material. Existing structure walls that are damaged are to be repaired consistent with original construction.

All existing solid and structurally sound capstones are to be carefully removed, cleaned of all extraneous material and returned to MCPW. Existing capstone is to be cleaned in such manner as to be non-deleterious to existing capstone. Any existing capstone that is broken during excavation or salvage operations, or found to be unacceptable by Project Manager is to be disposed of.

To permanently eliminate existing capstone, existing capstone catch basin structure walls are to be dismantled by hand to depth sufficient to accommodate new reinforced Class A concrete lintel, and installation of full length piece of curb. New concrete lintel is to be constructed across portion of existing structure that is located behind and under curb line, is to be formed, and reinforced with number 4 rebar.

If necessary, use brick and mortar or concrete to adjust top of existing capstone catch basin structure walls to grade before installing existing or new frame and grate.

Apply two coats of appropriate dampproof material to all new exterior and interior concrete surfaces of capstone catch basin structure, making sure that all surfaces are thoroughly covered.

S604-3.05 Relocate Existing Catch Basin/Field Inlet

Existing catch basin/field inlet frame and grate, and if required access frame and cover, is to be removed and cleaned of all extraneous material. Any portion of existing structure walls that are damaged are to be repaired consistent with original construction.

Carefully excavate around existing catch basin/field inlet structure in such manner as not to damage existing structure and until existing structure is completely exposed. Disconnect existing lateral and underdrain pipes. Carefully pick up, move and reinstall existing structure in its new location in such manner as not to damage existing structure.

If necessary, use brick and mortar or concrete to adjust top of existing catch basin/field inlet structure walls to grade before installing existing or new frame and grate.

If existing lateral pipe is to be abandoned, open end of existing lateral pipe is to be plugged per Subsection S604-3.09 Abandon and Remove Existing Catch Basin/Field Inlet.

Connect existing or new lateral and underdrain pipes to catch basin/field inlet structure. If existing lateral pipe is to be reconnected, existing lateral pipe is to be thoroughly cleaned of all extraneous material before being reconnected. Connections are to be made flush with inside face of structure wall, and are to project outside of structure sufficient distance to allow for proper connection with adjoining lateral and underdrain pipe sections. Lateral and underdrain pipes are to fit neatly and tightly within structure wall, and connections thoroughly sealed with epoxy grout and mortar. Any excess openings in structure walls are to be blocked up with brick and mortar. Finish off with concrete, completely filling in all voids and thoroughly sealing up both exterior and interior sides of opening. Surfaces of blocked up opening are to be smooth, blend in with surrounding surface, without any excess projections, and dampproofed.

Apply two coats of appropriate dampproof material to all new exterior and interior concrete surfaces of catch basin/field inlet structure, making sure that all surfaces are thoroughly covered.

S604-3.06 Clean Existing Catch Basin/Field Inlet and Lateral Pipe

Existing catch basin/field inlet structure and lateral pipe is to be cleaned of all extraneous material and kept clean until final acceptance of work.

S604-3.07 Dampproof Existing Catch Basin/Field Inlet

Dampproofing is to be applied to all existing concrete catch basin/field inlet structure surfaces that are exposed, and where existing dampproofing is either damaged or nonexistent.

Entire surface area of existing concrete catch basin/field inlet structure are to be thoroughly cleaned by sand blasting or water pressure, removing all existing dampproofing and other extraneous materials, and otherwise prepared so as to be in condition suitable for proper application of new dampproof material.

For interior surface of existing concrete catch basin/field inlet structure that is being adjusted, relocated or cleaned, and new dampproofing material is required to be applied due to damaged or missing dampproofing, entire interior surface of structure is to be treated.

For exterior surface of existing concrete catch basin/field inlet structure that is being relocated, and new dampproofing material is required to be applied due to damaged or missing dampproofing, entire exterior surface of structure is to be treated.

S604-3.08 Temporary Adjustment of Catch Basin/Field Inlet Frame and Grate

Where required for an extended layover, or for winter shut down, temporary riser section is to be built on top of existing catch basin/field inlet structure walls to temporarily set frame and grate to grade.

Fill existing keyway with sand, construct temporary riser using brick and mortar on top of existing structure walls to proper height necessary to set frame and grate to grade. One coat of dampproof material is to be applied to exterior and interior surfaces of temporary riser section. Prior to final paving, remove temporary riser section and sand fill, and properly dispose of all materials.

After removal of temporary riser section, construct permanent riser section and install catch basin/field inlet, and/or access frame and cover, in accordance with appropriate subsections for catch basin/field inlet construction in Section S604 Catch Basin and Sewer Manhole.

S604-3.09 Abandon and Remove Existing Catch Basin/Field Inlet

Existing catch basin/field inlet frame and grate, and if required access frame and cover, is to be removed, cleaned of all extraneous material and returned to MCPW. Existing catch basin/field inlet structure is to be completely removed and disposed of.

Existing lateral pipe is to be abandoned in place and plugged. For existing lateral pipe 6 inch diameter and smaller, insert rubber gasketed mechanical type permanent plug into lateral pipe. For existing lateral pipe over 6 inch diameter, insert brick into lateral pipe until opening is plugged as much as possible. Completely fill and seal remaining void at open end of existing lateral pipe with regular cement mortar type II cement.

If existing underdrain pipe system is to remain, connect open ends with new underdrain pipe.

S604-3.10 Catch Basin Wall Repair

Existing catch basin wall that is to be repaired is to be dismantled to point where wall is structurally sound. Work to repair damaged wall is to be consistent with original construction. Catch basin and lateral pipe are to be cleaned to main sewer of all construction and any other extraneous debris, and maintained clean for duration of project. All debris removed is to be promptly disposed of.

S604-3.11 Adjustment or Replacement of Sewer Manhole Frame and Cover

Existing sewer manhole frame and cover are to be removed and cleaned of all extraneous material. If replacement frame and cover are to be installed, existing frame and cover are to be disposed of.

Remove portion of existing sewer manhole riser section as necessary to retrofit frame and cover to new finished grade and on sound bearing. For adjustment use either new concrete adjustment ring set on 1/2 inch thick bed of mortar, or bricks/concrete blocks and mortar. After placing frame, frame and rebuilt riser section are to be completely encased within 12 inches of concrete. Top of concrete encasement is to be minimum of 3-1/2 inches below grade in pavement area, and 5 inches below grade outside of pavement area. One coat of dampproof material is to be applied to interior surface of all adjustment courses.

S604-3.12 Temporary Adjustment of Sewer Manhole Frame and Cover

Where required for an extended layover, or for winter shut down, temporary riser section is to be built on top of existing sewer manhole structure walls to temporarily set frame and cover to grade.

Remove portion of existing sewer manhole riser section as necessary to retrofit frame and cover to new grade and on sound bearing. Construct temporary riser using brick and mortar on top of existing structure walls to proper height necessary to set frame and cover to grade. After placing frame, frame and temporary riser section are to be completely encased within 12 inches of concrete. Apply one coat of dampproof material to interior surface of temporary riser section.

Prior to final paving, remove temporary riser section and concrete encasement, and properly dispose of all materials.

After removal of temporary riser section, construct permanent riser section and install sewer manhole frame and cover in accordance with Subsection S604-3.11 Adjustment or Replacement of Sewer Manhole Frame and Cover.

S604-4 METHOD OF MEASUREMENT

S604-4.01 Catch Basin/Field Inlet

Quantity to be measured for payment will be number of new catch basin/field inlet structures constructed; or existing catch basin/field inlet structures modified, relocated, cleaned, or abandoned.

For type D catch basin, measurement will be made with frame and grate, including access frame and cover, counted as one complete unit.

Under this pay unit, maximum invert depth for new catch basin/field inlet structure construction will be up to 4 feet 6 inches (4.50'), as measured between elevation of top of grate and elevation of interior floor of new structure.

S604-4.02 Additional Depth of New Catch Basin/Field Inlet

Quantity to be measured for payment will be number of linear feet of additional depth for new catch basin/field inlet structure construction, where maximum invert depth exceeds 4 feet 6 inches (4.50') as specified in Subsection S604-4.01 Catch basin/field inlet, as measured to nearest tenth (0.10) of foot.

S604-4.03 Adjust Existing Catch Basin/Field Inlet Frame and Grate, Access Frame and Cover

Quantity to be measured for payment will be number of existing catch basin/field inlet frame and grate, and access frame and cover, units adjusted. For type D catch basin, measurement will be made with frame and grate, including access frame and cover, counted as one complete unit.

S604-4.04 Dampproof Existing Catch Basin/Field Inlet

Quantity to be measured for payment will be number of existing catch basin/field inlet structures where entire exterior and/or interior portion is required to be dampproofed. Measurement will be made separately for both interior and exterior dampproofing, they will not be counted as one complete unit.

Separate payment for dampproofing will be limited only to those existing catch basin/field inlet structures that are not already dampproofed, or where existing dampproofing needs to be completely replaced.

No separate payment will be made for dampproofing of new catch basin/field inlet structure construction.

S604-4.05 Temporary Adjustment of Catch Basin/Field Inlet Frame and Grate

Quantity to be measured for payment will be number of catch basin/field inlet structures topped with temporary brick riser section.

S604-4.06 Catch Basin Wall Repair

Quantity to be measured for payment will be number of linear feet of catch basin wall repaired as measured to nearest tenth (0.10) of foot. Linear feet of catch basin wall repaired will be measured vertically along area repaired, and will include all sides of catch basin.

> i.e.: Four walls of catch basin that are repaired for 1 foot in height will be measured as 1 linear foot of repair.

S604-4.07 Sewer Manhole Frame and Cover

Quantity to be measured for payment will be number of sewer manhole frames and covers adjusted, replaced, or temporarily adjusted.

S604-5 BASIS OF PAYMENT

S604-5.01 Catch Basin/Field Inlet - General

Unit price bid includes cost of: sheeting; shoring; verifying existing and proposed top of grate and invert elevations; furnishing and installing precast structure; constructing cast-in-place structure; concrete; forms; key way; rebar; mortar; epoxy grout; dampproofing; frames and grates; stone bedding leveling course; field repair of improperly fitting frame and grate; providing openings for connection of lateral and underdrain pipe; connecting and sealing lateral and underdrain pipes to structure; cleaning out structure and lateral pipe; disposing all extraneous material; and furnishing all labor, material and equipment necessary to complete work.

Where an existing catch basin is being replaced with new catch basin, and existing catch basin falls within general trench excavation limits for new catch basin and/or lateral pipe, removal of existing catch basin structure is considered to be part of general trench excavation for new catch basin and/or lateral pipe.

Where an existing catch basin is being replaced with new catch basin, and existing catch basin falls outside of general trench excavation limits for new catch basin and/or lateral pipe, removal of existing catch basin structure will not be considered to be part of general trench excavation for new catch basin and/or lateral pipe, and will be paid for separately under Section R206 Trench and Culvert Excavation.

Excavation including hand and tunnel excavation, and furnishing and placing of select granular backfill (sewer) will be paid for under separate bid items or included in unit price bid for item as indicated in item description.

Pavement base or pavement restoration, will be paid for under separate bid items or included in unit price bid for item as indicated in item description.

In addition, unit price bid for following individual work items will also include cost of:

A. Type C Catch Basin

Unit price bid also includes cost of: furnishing and installing hooded trap and underdrain check valve.

B. Type D Catch Basin

Unit price bid also includes cost of: furnishing and installing access frame and cover; field repair of improperly fitting access frame and cover.

C. Type A and Type B Catch Basin (Furnished)

Unit price bid also includes cost of: making arrangements for and picking-up precast structure, including frame and grate.

D. Type B and Type D Catch Basin – Installed

Unit price bid also includes cost of: excavation, backfill, select granular backfill (sewer).

E. Type B and Type D Catch Basin – Installed (Furnished)

Unit price bid also includes cost of: making arrangements for and picking-up precast structure, including frame and grate; excavation, backfill, select granular backfill (sewer).

F. Additional Depth of New Catch Basin/Field Inlet

Unit price bid also includes cost of: furnishing and constructing additional cast-in-place portion that exceeds maximum invert depth of 4 feet 6 inches (4.50').

G. Adjust Existing Catch Basin/Field Inlet Frame and Grate, Access Frame and Cover

Unit price bid also includes cost of: excavation; backfill; select granular backfill (sewer); removing, cleaning and resetting existing frame and grate; access frame and cover; repairing existing structure walls; scarifying or removal of existing concrete riser section; removal temporary brick riser; furnishing and installing concrete cap; epoxy polysulfide grout; drilling holes.

S604-5.02 Modify Existing Capstone Catch Basin

Unit price bid includes cost of: excavation; backfill; removing, cleaning, returning or disposing existing capstone; removing, cleaning, resetting or disposing existing frame and grate; repairing existing capstone catch basin walls; hand dismantling or otherwise preparing top portion existing capstone catch basin walls; furnishing and installing concrete lintel; brick and mortar or concrete cap; masonry; forms; epoxy polysulfide grout; rebar; grout; dampproofing; cleaning capstone catch basin structure and lateral pipe; disposing all extraneous material; and furnishing all labor, material and equipment necessary to complete work.

Furnishing and installing new frame and grate will be paid for separately under Section R655 Frame and Grate.

S604-5.03 Relocate Existing Catch Basin/Field Inlet

Unit price bid includes cost of: removing, moving, resetting and cleaning existing catch basin/field inlet structure; frame and grate; access frame and cover; repairing existing catch basin/field inlet walls; disconnecting existing lateral and underdrain pipes; connecting and sealing existing or new lateral and underdrain pipes; plugging existing lateral pipe to be abandoned; furnishing and installing permanent mechanical plug; brick; cement mortar; furnishing and installing brick and mortar or concrete cap; concrete; forms; epoxy polysulfide grout; rebar; grout; drilling holes; blocking up and sealing excess openings; dampproofing; cleaning catch basin/field inlet structure; lateral pipe; disposing all extraneous material; and furnishing all labor, material and equipment necessary to complete work.

Furnishing and installing new frame and grate, and if required access frame and cover, will be paid for separately under Sections R655 Frame and Grate and S655 Frame and Grate.

S604-5.04 Clean Existing Catch Basin/Field Inlet and Lateral Pipe

Unit price bid includes cost of: cleaning existing catch basin/field inlet and lateral pipe; disposing all extraneous material; and furnishing all labor, material and equipment necessary to complete work.

S604-5.05 Dampproof Existing Catch Basin/Field Inlet

Unit price bid includes cost of: furnishing and applying dampproof material; cleaning existing surfaces by sand blasting, water pressure, or any other acceptable method; disposing all extraneous material; and furnishing all labor, material and equipment necessary to complete work.

S604-5.06 Temporary Adjustment of Catch Basin/Field Inlet Frame and Grate

Unit price bid includes cost of: excavation; backfill; select granular backfill (sewer); furnishing, installing, removing and disposing temporary brick and mortar riser section; sand fill; setting, removing, maintaining and installing catch basin/field inlet frame and grate; access frame and cover; dampproofing; and furnishing all labor, material and equipment necessary to complete work.

Final adjustment or replacement of catch basin/field inlet frame and grate, and/or access frame and cover, will be paid for under separate bid items.

S604-5.07 Abandon and Remove Existing Catch Basin/Field Inlet

Unit price bid includes cost of: removing, cleaning and returning existing catch basin/field inlet frame and grate; access frame and cover; removing and disposing existing catch basin/field inlet structure; disconnecting, abandoning and plugging existing lateral; furnish and install new underdrain pipe to reconnect open ends of existing underdrain pipe; furnishing and installing permanent mechanical plug; brick; cement mortar; disposing all extraneous material; and furnishing all labor, material and equipment necessary to complete work.

S604-5.08 Catch Basin Wall Repair

Unit price bid includes cost of: excavation; furnishing and installing select granular backfill (sewer); dismantling and repairing damaged catch basin walls; cleaning existing catch basin and lateral; disposing of all debris; furnishing and applying dampproofing on interior and exterior areas of new concrete; and furnishing all labor, material and equipment necessary to complete work.

S604-5.09 Adjustment or Replacement of Sewer Manhole Frame and Cover

Unit price bid includes cost of: excavation; backfill; removing, cleaning, resetting or returning existing manhole frame and cover; field repair of improperly fitting manhole frame and cover; preparing existing manhole riser to install manhole frame and cover to finished grade; removal of existing brick courses as necessary; furnishing and installing concrete adjustment ring; bricks/concrete blocks; mortar mix; concrete encasement; dampproofing; cleaning existing manhole structure; disposing all extraneous material; and furnishing all labor, material and equipment necessary to complete work.

For manhole frame and cover units that are furnished, unit price bid will also cost of: picking up and installing new manhole frame and cover.

S604-5.10 Temporary Adjustment of Sewer Manhole Frame and Cover

Unit price bid includes cost of: excavation; backfill; removing, cleaning and resetting existing sewer manhole frame and cover; preparing existing sewer manhole riser including removal of portion of existing sewer manhole structure as necessary; furnishing, installing and removing temporary brick and mortar riser section and concrete encasement; dampproofing; cleaning existing sewer manhole structure; disposing of all removed materials; and furnishing all labor, material and equipment necessary to complete work.

Final adjustment or replacement of sewer manhole frame and cover will be paid for under separate bid item.

S604-5.11 New Sewer Manhole Frame and Cover

Unit price bid includes cost of: excavation; backfill; furnishing and installing new manhole frame and cover; field repair of improperly fitting manhole frames and covers; preparing manhole riser to install manhole frame and cover to finished grade; furnishing and installing concrete adjustment ring; bricks/concrete blocks; mortar mix; concrete encasement; dampproofing; cleaning manhole structure; disposing all extraneous material; and furnishing all labor, material and equipment necessary to complete work.

For manhole frame and cover units that are furnished, unit price bid will also cost of: picking up and installing new manhole frame and cover.

S604-5.12 Excavation, Backfill, Pavement Base Restoration and Pavement Restoration

Excavation including hand and tunnel excavation, furnishing and placing of stone bedding and select granular backfill (sewer), and either pavement base or pavement restoration, will be paid for under separate bid items or included in unit price bid for item as indicated in item description.

No separate payment will be made for placement of select backfill material excavated from trench.

Excavation that is included in bid item does not include rock excavation. Rock excavation will be paid for under separate bid item.

Where bid item includes cost of pavement base restoration, pavement base may consist of either concrete base or asphalt base course, as required in Contract Documents. Unit price bid will be same regardless of which type of pavement base is used, and bid items will include cost of: subbase courses type 1 and type 2; either Class C concrete foundation or asphalt base course.

Where bid item includes cost of pavement restoration, pavement base may consist of either concrete base or asphalt base course, as required in Contract Documents. Unit price bid will be same regardless of which type of pavement base is used, and bid items will include cost of: subbase courses type 1 and type 2; either Class C concrete foundation or asphalt base course; asphalt binder course; asphalt top course; and asphalt tack coat.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S604.30	Type A Catch Basin	Each
S604.31	Type B Catch Basin	Each
S604.32	Type C Catch Basin	Each
S604.33	Type D Catch Basin	Each
S604.34	Field Inlet	Each
S604.35	Type A Catch Basin (Furnished)	Each
S604.36	Type B Catch Basin (Furnished)	Each
S604.3701	Type B Catch Basin - Installed (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.3702	Type B Catch Basin - Installed (Including Excavation, Backfill and Pavement Restoration)	Each
S604.3703	Type D Catch Basin - Installed (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.3704	Type D Catch Basin - Installed (Including Excavation, Backfill and Pavement Restoration)	Each
S604.3801	Type B Catch Basin - Installed (Furnished) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.3802	Type B Catch Basin - Installed (Furnished) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.40	Additional Depth Type A Catch Basin	Linear Foot
S604.41	Additional Depth Type B Catch Basin	Linear Foot
S604.4101	Additional Depth Type B Catch Basin (Including Excavation and Backfill)	Linear Foot
S604.42	Additional Depth Type C Catch Basin	Linear Foot
S604.43	Additional Depth Type D Catch Basin	Linear Foot
S604.44	Additional Depth Field Inlet	Linear Foot
S604.50	Adjust Existing Catch Basin Frame and Grate (Including Excavation and Backfill)	Each
S604.5001	Adjust Existing Field Inlet Frame and Grate (Including Excavation and Backfill)	Each
S604.5002	Adjust Existing Catch Basin Access Frame and Cover (Including Excavation and Backfill)	Each
S604.5004	Adjust Existing Catch Basin Frame and Grate (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.5005	Adjust Existing Catch Basin Frame and Grate (Including Excavation, Backfill and Pavement Restoration)	Each
S604.51	Modify Existing Capstone Catch Basin (Including Excavation and Backfill)	Each
S604.52	Relocate Existing Catch Basin	Each
S604.5201	Relocate Existing Field Inlet	Each
S604.53	Clean Existing Catch Basin and Lateral Pipe	Each
S604.5301	Clean Existing Field Inlet and Lateral Pipe	Each
S604.54	Dampproof Existing Catch Basin	Each
S604.5401	Dampproof Existing Field Inlet	Each

ITEM NO.	ITEM	PAY UNIT
S604.55	Temporary Adjustment of Catch Basin Frame and Grate (Including Excavation and Backfill)	Each
S604.5501	Temporary Adjustment of Field Inlet Frame and Grate (Including Excavation and Backfill)	Each
S604.560101	Abandon and Remove Existing Catch Basin	Each
S604.560201	Abandon and Remove Existing Catch Basin (Including Excavation and Backfill)	Each
S604.560302	Abandon and Remove Existing Catch Basin (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.560303	Abandon and Remove Existing Catch Basin (Including Excavation, Backfill and Pavement Restoration) and Backfill)	Each
S604.570101	Abandon and Remove Existing Field Inlet	Each
S604.570201	Abandon and Remove Existing Field Inlet (Including Excavation	Each
S604.570302	Abandon and Remove Existing Field Inlet (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.570303	Abandon and Remove Existing Field Inlet (Including Excavation, Backfill and Pavement Restoration)	Each
S604.58	Catch Basin Wall Repair	Linear Foot
S604.60	Adjust Existing Sewer Manhole Frame and Cover (Including Excavation and Backfill)	Each
S604.61	Replace Existing Sewer Manhole Frame and Cover (Furnished) (Including Excavation and Backfill)	Each
S604.62	Temporary Adjustment of Sewer Manhole Frame and Cover (Including Excavation and Backfill)	Each
S604.63	Replace Existing Sewer Manhole Frame and Cover (Including Excavation and Backfill)	Each
S604.64	Replace Existing Sewer Manhole Frame and Cover with New Watertight Manhole Frame and Cover (Including Excavation and Backfill)	Each
S604.65	Clean Existing Manhole	Each
S604.66	New Sewer Manhole Frame and Cover (Including Excavation and Backfill)	Each
S604.67	New Sewer Manhole Frame and Cover (Furnished) (Including Excavation and Backfill)	Each
S604.68	New Watertight Sewer Manhole Frame and Cover (Including Excavation and Backfill)	Each
S604.69	New Watertight Sewer Manhole Frame and Cover (Furnished) (Including Excavation and Backfill)	Each

REVISED March 3, 2015

SECTION S605 - UNDERDRAIN

S605-1 DESCRIPTION

Work consists of installing underdrain pipe and filter material as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

S605-2 MATERIALS

S605-2.01 Filter Material

Material and gradation tests and quality control methods pertaining to requirements and work of this section will be performed as ordered by Project Manager. Underdrain filter material is to be stockpiled and approved by Project Manager prior to installation.

Underdrain filter material is to consist of crushed stone, sand, gravel or screened gravel, in accordance with following gradation requirements:

Screen Size	Percent Passing by Weight
1 inch	100%
1/2 inch	30 to 100%
1/4 inch	0 to 30%
#10	0 to 10%
#20	0 to 5%

Soundness of materials meeting requirements of NYSDOT Sections 703-02 Coarse Aggregate or 703-10 Lightweight Aggregates, is acceptable for use as underdrain filter material. When electing to use material from sources not approved under NYSDOT Sections 703-02 Coarse Aggregate or 703-10 Lightweight Aggregates, soundness of material is to be tested and is not to have loss exceeding 20 percent by weight after four cycles of Magnesium Sulphate Soundness Test.

S605-2.02 Perforated Corrugated Polyethylene Underdrain Tubing

Perforated corrugated polyethylene underdrain tubing and fittings are to be black in accordance with AASHTO M252 Corrugated Polyethylene Drainage Tubing.

Perforated corrugated polyethylene underdrain tubing is to be furnished in straight lengths with minimum nominal length of 20 feet. Coiled pipe may be substituted for straight tubing only in those areas where it would be more appropriate and as approved by Project Manager.

S605-2.03 Perforated Corrugated Steel Underdrain Pipe

Perforated corrugated steel underdrain pipe and fittings are to be 16 gauge Type III in accordance with AASHTO M 36 Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains.

Where bituminous coating is required, pipe and fittings are to be coated in accordance with AASHTO M 190 Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches - Type A Fully Bituminous Coated.

S605-2.04 High-Density Perforated Corrugated Polyethylene Pipe

High-density perforated corrugated polyethylene pipe and fittings is have smooth interior, and is to be in accordance with AASHTO M 252 Corrugated Polyethylene Drainage Pipe Type SP for 4 through 10 inch diameter pipe, and AASHTO M 294 Corrugated Polyethylene Pipe Type SP for 12 inch diameter and larger pipe.

S605-3 CONSTRUCTION DETAILS

S605-3.01 Underdrain Filter Material - General

Where required, underdrain trench is to be encased with geotextile material in accordance with Section S207 Geotextiles.

Underdrain filter material is to be loosely placed around and over underdrain pipe to such depth that, after compaction, underdrain filter material will extend to level 4 inches above underdrain pipe.

For perforated corrugated polyethylene underdrain tubing and high-density perforated corrugated polyethylene pipe, underdrain filter material is to be compacted by three passes of vibrating pad or drum type compactor. For perforated corrugated steel underdrain pipe, underdrain filter material is to be compacted by two passes of vibrating pad or drum type compactor.

In event underdrain pipe is not to be installed, underdrain filter material is to be placed in lifts not exceeding 6 inches in thickness prior to compaction. Each lift is to be compacted by two passes of vibrating pad or drum type compactor.

Placement and compaction operations are to be conducted in manner so as to insure that top surface of each lift does not become contaminated by adjacent backfill materials. Contaminated underdrain filter material is to be replaced.

S605-3.02 Underdrain Filter Material at Structures

Underdrain filter material is to be placed in lifts not exceeding 6 inches in thickness, and is to precede placement of any adjacent backfill material. Temporary barrier may be used between underdrain filter material and adjacent backfill material. Temporary barrier is to be removed prior to compaction.

Each lift of underdrain filter material and adjacent backfill material located within minimum distance of 3 feet from backwall plus footing heel projection of any structure, is to be compacted simultaneously. Each lift is to be compacted by two passes of vibratory compactor.

Placement and compaction operations are to be conducted in manner so as to insure that top surface of each lift does not become contaminated by adjacent backfill materials. Contaminated underdrain filter material is to be replaced.

S605-3.03 Underdrain Tubing/Pipe

Storage and handling of underdrain tubing/pipe is to be in accordance with AASHTO M252 Corrugated Polyethylene Drainage Tubing, and AASHTO M 36 Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains, as appropriate.

Underdrain tubing/pipe is to be installed in accordance with Section R601-3 Construction Details.

Perforated underdrain tubing/pipe is to be placed on level and compacted bed of underdrain filter material. Where proper vertical alignment cannot be maintained, lengths of underdrain tubing/pipe are to be cut and secured with approved couplings. Sections of underdrain tubing/pipe are to be joined only with approved fittings, and are not to be split to make connection. Upgrade end of underdrain tubing/pipe is to be closed with appropriate plug or cap.

Where existing underdrain pipe is being replaced with new underdrain tubing/pipe, remove sufficient length of existing underdrain pipe to accommodate proper installation of new underdrain tubing/pipe. Remaining portion of existing underdrain pipe is to be abandoned by plugging open ends with concrete to minimum depth of 12 inches.

S605-3.04 High-Density Perforated Corrugated Polyethylene Pipe

High-density perforated corrugated polyethylene pipe is to be used in applications where combination underdrain and lateral pipe is required.

Storage and handling of pipe is to be in accordance with AASHTO M 252 Corrugated Polyethylene Drainage Pipe Type SP for 4 through 10 inch diameter pipe, and AASHTO M 294 Corrugated Polyethylene Pipe Type SP for 12 inch diameter and larger pipe.

S605-3.05 Underdrain Tubing/Pipe Connection

Underdrain tubing/pipe connections at catch basin or manhole structures are to be thoroughly sealed with concrete and 100 per cent epoxy grout material.

Openings in concrete structures are to be made by coring.

Openings in brick structures are to be made either by removing existing brick, or by coring.

S605-4 METHOD OF MEASUREMENT

S605-4.01 Underdrain Filter Material

Quantity to be measured for payment will be number of cubic yards of filter material installed.

Measurement for this item will be made only in those areas where filter material is installed without underdrain tubing/pipe.

S605-4.02 Underdrain Tubing/Pipe

Quantity to be measured for payment will be number of linear feet of underdrain tubing/pipe installed.

S605-5 BASIS OF PAYMENT

S605-5.01 General all Items

Unit price bid for all items includes cost of: excavation; pavement saw cutting; and furnishing all labor, material and equipment necessary to complete work.

No payment will be made for any losses of material which may result from compaction, foundation settlement, erosion, or any other causes. Cost of such losses is to be included in unit price bid for these items.

Furnishing and installing geotextile material will be paid for under Section S207 Geotextiles.

Excavation that is included in pay item does not include rock excavation. Rock excavation will be paid for under separate bid item.

S605-5.02 Underdrain Filter Material

Unit price bid also includes cost of: furnishing and placing underdrain filter material, without underdrain pipe.

S605-5.03 Underdrain Tubing/Pipe

Unit price bid also includes cost of: cutting, abandoning, plugging, removing existing underdrain pipe; furnishing and installing underdrain tubing/pipe; furnishing, placing and compacting underdrain filter material; making connection to catch basins, manholes and existing underdrain pipe; enlarging existing openings or making new openings in catch basin or manhole structures for connection of underdrain pipe; sealing connection with concrete and epoxy grout; plugging, capping unconnected ends of underdrain tubing/pipe.

Payment will be made under:

Note: XX in bid item number and X" in item description represent size of underdrain tubing/pipe. i.e.: 6 inch underdrain tubing would be bid as S605.140106 X" Perforated Corrugated Polyethylene Underdrain Tubing.

ITEM NO.	ITEM	PAY UNIT
S605.13	Underdrain Filter Material	Cubic Yard
S605.1401XX	X" Perforated Corrugated Polyethylene Underdrain Tubing	Linear Foot
S605.15XX	X" Perforated Corrugated Steel Underdrain Pipe - Uncoated	Linear Foot
S605.16XX	X" Perforated Corrugated Steel Underdrain Pipe - Coated	Linear Foot
S605.1701XX	X" High Density Perforated Corrugated Polyethylene Pipe	Linear Foot

REVISED May 1, 2013

SECTION S610 - LANDSCAPE

S610-1 DESCRIPTION

Work consists of establishment and maintenance of turf in lawn areas, and miscellaneous treatment of planting areas as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

S610-2 MATERIALS

S610-2.01 Turf Establishment

Contractor must provide following certifications to Project Manager:

- Certification statement from grass seed mixture vendor stating botanical and common names, percentage by weight, and percentage of purity and germination for each type of grass seed provided in mixture
- Certification statement from material manufacturer for fertilizers, soil amendments, herbicides and pesticides, and any other chemicals that may be required, including instructions for proper application method
- Certification statement from material manufacturer for turf mulch and tackifier

Pesticide appliers must be licensed and fully trained in use and application of pesticides. In no case is Contractor to permit use or application of any pesticide material by non-approved, unlicensed and untrained personnel, or by any non-approved application method.

S610-2.02 Topsoil Material

Topsoil material is to be in accordance with requirements of Section S613 Topsoil.

S610-2.03 Soil Amendments

Soil amendments that are to be used for adjustment of soil chemistry are to be standard commercial type including but not limited to ground limestone, gypsum, products containing phosphorus, potassium, sulphur, et cetera.

S610-2.04 Limestone

Limestone is to be standard, pulverized commercial type having minimum total neutralizing value of 88 percent calcium carbonate equivalence, which is to be applied at rate sufficient to bring pH of topsoil material to range of 6.0 to 7.5, as determined by testing lab.

S610-2.05 Grass Seed Mixture

Grass seed is to be fresh, clean or new crop seed. Grass seed mixture is not to contain more than 0.10 percent poa annua, is to be free of bent grass and noxious weed seed, and is to be composed of varieties listed in Grass Seed Mixture table, or approved equivalent. Grass seed mixture is to be composed to specified species proportions by weight, and tested to minimum percentages of purity and germination.

Equivalent grass seed varieties proposed for use are to be branded grass seed varieties that have been tested by an independent or New York State certified testing organization, and have shown average or better performance under low maintenance conditions in northeastern region of United States.

Generic or non-branded grass seed varieties are not to be used. Fine fescues should be combination of rhizomatous creeping red fescue and some chewings fine fescue varieties.

Grass Seed Mixture		
Species	**Maximum Percent of Mix by Weight**	**Varieties**
Fine Fescue	35%	creeping red fescue varieties: dawson, flyer, jasper, seabreeze, shademaster II (rhizomatous chewings fine fescue variety may be used in combination with creeping red fescue variety, but is not to exceed 1/2 of fine fescue blend)
Kentucky Bluegrass	30%	baron, baronie, bartitia, caliber, canterbury, dragon, eagleton, kenblue, northstar, rambo
Perennial Ryegrass	20%	blazer III, brightstar II, line drive, monterey, palmer III, panther, secretariat, SR4200, top hat
Alkali Grass	15%	fults, SL-633 (variety of above species that performs similarly in alkali soil turf grass tests may be substituted)

S610-2.06 Turf Fertilizer

Apply any fertilizer necessary to produce an acceptable uniform viable turf.

S610-2.07 Turf Mulch and Mulch Tackifier

Turf mulch is to be wood fiber hydromulch with mulch tackifier.

Straw mulch is to be clean oat or wheat straw well seasoned before baling, free from mature seed bearing stalks, foreign matter or roots of prohibited or noxious weeds. Mulch tackifier is to be vegetable-based, PAM-based, or other non-asphaltic tackifier suitable for an urban street environment.

Hay mulch, plastic mulch, and mulches derived from or contaminated by insulation manufacture, are not to be used.

S610-2.08 Weed Killer

Weed killer is to be registered weed control product that complies with applicable Federal, State, and local laws and regulations.

S610-2.09 Shredded Bark Mulch

Shredded bark mulch is to be maximum 1/2 to 1 inch in size, partially decomposed, free of disease and debris, with no green leaf matter or sprouts.

S610-2.10 Pea Stone

Pea stone is to be washed, well graded, free from organic or other deleterious materials and is to meet following gradation requirements:

Screen Size	Percent Passing by Weight
1/2 inch	100%
1/4 inch	85 to 100%
1/8 inch	0 to 15%

Material will be accepted on basis of Magnesium Sulfate Soundness Loss after 4 cycles of 20 percent or less.

Not more than 30 percent, by weight, of particles retained on 1/2 inch sieve is to consist of flat or elongated particles. Flat or elongated particle is defined as one which has its greatest dimension more than 3 times its least dimension. Acceptance for this requirement will normally be based on visual inspection by Project Manager. When City elects to test for this requirement, material with percentage of flat or elongated particles that exceeds maximum 30 percent will be rejected. All material is to meet specified gradation requirements prior to placement. All processing of material is to be completed at originating source.

Materials are to be stockpiled. Stockpile construction requirements, sampling, testing and acceptance or rejection procedures will be as stipulated in appropriate NYSDOT departmental publication.

S610-2.11 Water

Water is to have pH of between 6.0 and 8.0, and is to be free of oil and any other substance that may be harmful to plant growth.

S610-3 CONSTRUCTION DETAILS

S610-301 General

Minimum of 14 days prior to commencing work, written schedule of planned operations for seeding/reseeding of lawn areas, application of fertilizers and weed killers is to submitted to Project Manager for approval. Such written schedule is also to include specific methods and materials to be used.

At least 5 days prior to application, written notice is to be provided to Project Manager and residents of intent to apply grass seed, turf mulch and mulch tackifier, fertilizers and/or weed killers. Written notice to residents is to be in format as approved of by Project Manager.

Do not apply weed killer at locations where resident objects to such application of weed killer.

Existing surface areas are to be free of all undesirable material which is larger than 1 inch in its greatest dimension. Such undesirable materials are, but not limited to: refuse; paving materials such as concrete, asphalt, brick; materials which are toxic to plant growth and grass seed; subsoil; woody vegetation, stumps, roots, brush; clods, hard lumps, and rocks. Sod and herbaceous growth such as grass and weeds need not be removed from existing soil, but are to be thoroughly broken up and mixed into overall soil material. All embedded foreign objects are to be removed and resultant hole filled-in with topsoil material. Contractor is to remove and dispose of any undesirable materials prior to treating surface area.

Existing surface is to be regraded as necessary to be uniform in contour and to meet required grades and cross-slopes without any irregularities. Finished grades and cross-slopes are to be uniformly sloping between tops of adjacent features such as sidewalks, driveways, curbs, or other existing lawn areas. Final surface contour is to be checked for accordance to required grades and cross-slopes by use of surveying instruments or other method as approved by Project Manager. Eliminate irregularities which form low areas and may tend to pond water when regrading, or by filling-in low area with either topsoil or embankment in place material.

Excavation and disposal is to be in accordance with NYSDOT Section 203 Excavation and Embankment. Properly dispose of all excavated material off site within 24 hours. Stockpiling of excavated material at project site is not allowed.

Buildings, paved areas, plantings and other non-seeded areas are to be protected from any excessive over-spray of any of materials that are being applied.

S610-3.02 Tree Protection

Existing trees and tree roots within project limits are to be protected from damage by construction activities. Construction or excavated materials are not to be placed or stockpiled within limits of canopy of any existing tree, to prevent smothering of existing tree root system. Vehicles and other construction equipment are not to be parked on any tree root system, nor left running (idling) under limits of canopy of any existing tree.

Where cutting of existing tree roots is necessary, it is to be done with sharp cutting tools. Exposed tree roots are to be re-buried as soon as possible. Until exposed tree roots can be re-buried, exposed tree roots are to be covered with wet burlap. Burlap is to be kept wet until exposed tree roots can be re-buried.

Existing trees that are damaged by construction activities are to be repaired within 72 hours using current arboricultural standards. Those existing trees that are determined by City Forester to be damaged beyond repair, are to be removed and replaced by Contractor.

Topsoil that is placed around an existing tree is not to be placed any higher than 3 inches of original surface area at base of existing tree.

S610-3.03 Soil Amendments

Soil amendments are to be applied at rate sufficient to bring chemistry of existing soil to an pH acceptable range as determined by testing lab. Soil amendments are to be applied in accordance with manufacturer's instructions for safe and effective application.

S610-3.04 Topsoil and Compaction

Topsoil material is to be placed and compacted in accordance with Section S613 Topsoil.

S610-3.05 Surface Preparation for Turf Establishment

Finished surface is to be flush with, or not greater than 1/4 inch above finished surface of adjacent surfaces. Prior to seeding, existing surface is to be prepared per Subsection S610-3.01 General.

Finished surface is to be uniform and smooth, and in accordance with required grades and cross-slopes. Finished surface is not to have any irregularities greater than 1 inch as measured from 10 foot long straight edge laid on finished surface. In built-up and residential areas, this may require that existing surface be regraded and hand raked. Topsoil material is to be used to adjust existing surface to required degree of smoothness and uniformity.

Finished surface is to be maintained to required grades and cross-slopes, placing any additional topsoil material that may be necessary to correct any irregularities that may have developed. If additional topsoil material is required, surface is to be properly prepared to ensure cohesiveness between materials.

Tops and bottoms of all slopes are to be rounded to blend into each other and into existing adjacent surface areas so as not to leave any noticeable sharp breaks. Cuts and fills are to have maximum slope of 3 feet horizontally to 1 foot vertically.

Surface preparation work is to in accordance with Method 1, unless Method 2 has been specifically required in Contract Documents. Regardless of which method is used, finished surface of any area that is to be seeded is not to be rougher, or more uneven, than any adjacent existing lawn areas.

A. Method 1

Surface area to be seeded is to be scarified to depth of 1/2 inch to break-up surface crust immediately before seeding. undesirable materials are to be removed and properly disposed of off-site.

B. Method 2

Surface area to be seeded is to be harrowed, disced, or otherwise completely pulverized to state of tillage acceptable to Project Manager. Undesirable materials are to be removed and properly disposed of off-site.

S610-3.06 Turf Establishment

A. General

Utilize all measures as may be necessary to produce finished product that provides continuous blanket of turf, that demonstrates relatively uniform height that is free of undesirable grasses, weeds, molds, mosses, algae, lichens, disease, and other undesirable characteristics.

Within 2 days of having applied grass seed, Contractor is to provide written notice to residents on proper procedure for protecting and caring for seeded areas. Written notice to is to be in format as approved of by Project Manager.

Areas disturbed by construction activities that are not to be paved or otherwise landscaped, are to be fine graded and seeded.

B. Hydroseeding (Two Step Method)

Use hydromulcher (sprayer) and apply materials in accordance with manufacturer's recommendations. Apply materials at rate of application sufficient to meet required performance criteria, but not less than following:

- Grass seed - rate recommended by manufacturer
- Wood fiber mulch - 1,500 pounds per acre
- Mulch tackifier - rate recommended by manufacturer

C. Dry Seeding

Perform grass seeding operations when soil, wind, and other conditions are appropriate, at rate of application sufficient to meet required performance criteria, but not less than rate recommended by grass seed vendor.

D. Straw Mulch

Straw mulch may be used in lieu of hydromulch and only if approved for use by Project Manager.

Straw mulch is to be placed uniformly in continuous blanket on seeded areas within 24 hours of having placed seed, and anchored with liquid tackifier.

Apply materials at rate of application sufficient to meet required performance criteria, but not less than following:

- Straw mulch - 2-1/2 tons per acre, or two 50 pound bales per 1,000 square feet of area
- Liquid tackifier - rate recommended by manufacturer

S610-3.07 Weed Killer

Apply an approved weed killer as necessary to help produce relatively weed free turf. Weed killer may be used only after having received written approval from Project Manager.

Weed killer is to be applied according to manufacturer's safety and application recommendations, and in compliance with all applicable Federal, State and local ordinances, laws and regulations for public notice and methods of application.

S610-3.08 Turf Maintenance

Maintain all seeded areas until they have obtained continuous blanket of turf that is of relatively uniform height that is free of undesirable grasses, weeds, molds, mosses, algae, lichens, disease, and other undesirable characteristics, and has been accepted by City.

Maintenance will include but is not limited to: soil amendment; fertilizing; watering; de-weeding; mowing; applications of herbicides, fungicides, insecticides; regrading and reapplication of topsoil; and reseeding. Areas of topsoil or seeded areas that become washed out, eroded, rutted, damaged, settled below required grades, or achieve unsatisfactory germination, are to be repaired.

Water is to be applied to adequately maintain surface soil moisture for proper seed germination. After seed has germinated, continue to regularly water seeded area until initial growth of turf has been accepted by City.

Until initial growth of turf has been accepted by City, turf areas are to be mowed as frequently as necessary to maintain maximum turf height of 4 inches and to minimize weed growth. No more than 1/3 of height of grass blade is to be mowed off during any one mowing operation.

After reasonable period of time has elapsed, if Project Manager determines that any seeded area has failed to have satisfactorily produced thriving turf due to seeding operations and/or lack of proper maintenance, Contractor is to repeat all of work required by this specification to repair such failed area until satisfactory growth of turf has been established.

Acceptance of established turf by City will be based on turf having achieved performance standards in accordance with Subsection S610-3.09 Performance Acceptance Measures.

S610-3.09 Performance Acceptance Measures

Only turf that demonstrates that it has achieved required growth and quality characteristics as outlined in this specification to satisfaction of Project manager, will be accepted by City. Factors for assessing turf will include, but not be limited to: topsoil pH; uniformity of turf color, texture, height and density of growth; overall coverage of areas designated for seeding; absence of undesirable grasses, weeds, molds, mosses, algae, lichens, disease, and other undesirable characteristics; and uniformity of slope and overall drainage of surface.

S610-3.10 Shredded Bark Mulch/Pea Stone

If required, weed fabric barrier is to be placed over area to be treated before shredded bark mulch/pea stone is placed. Shredded bark mulch/pea stone is to be uniformly spread to required thickness and lightly compacted.

Shredded bark mulched/pea stone area is to be cared for until final acceptance of project. Such care is to consist of providing protection against pedestrian traffic by installing approved warning signs and barricades. Treated areas damaged by erosion, wind, fire or other causes are to be repaired as soon as possible to reestablish condition and grade of area prior to placing shredded bark mulch/pea stone, then retreated with new shredded bark mulch/pea stone.

S610-3.11 Development Site Preparation

Development site is to shaped and graded to final lines and grades as required in Contract Documents, and as required by Project Manager. Clean topsoil material stripped during shaping and grading operation is to be stockpiled on-site. Each stockpile is to contain at least 200 cubic yards of topsoil material, is to be at least 4 feet high, and is to be trimmed, shaped and maintained to uniform surfaces and slopes. Straw bales are to be placed around entire bottom of stockpile and staked to ground to help control erosion.

Stockpile is to be either thoroughly covered with weatherproof material, or seeded. Until stockpile has been adequately covered, periodically water down stockpile to minimize dust erosion. Weatherproof material used to cover stockpile is to be staked, tied, or otherwise weighted down. Weatherproof material is to be maintained as necessary by reaffixing any areas that become loose, replacing any areas where weatherproof material becomes torn, damaged or otherwise missing. Stockpile that is to be seeded, is to be seeded and maintained per requirements of this specification.

After all other phases of work are completed, all ground areas that are to be seeded are to be prepared in accordance with this specification. If there is an insufficient amount of stockpiled topsoil material available, supply and spread new topsoil material in accordance with Section S613 Topsoil.

Any excess stockpiled topsoil material will become property of and maintained by Developer(s).

S610-3.12 Water

Water may be brought to project site and applied via water truck, or may be applied through use of any existing hydrant. Before being allowed to use water from existing hydrants, obtain necessary permit(s), and install backflow prevention device and approved water meter.

Water is to be applied in such manner that required volume of water being applied does not damage, cause any erosion or otherwise disrupt any existing vegetation, mulch, plant saucers, sod, or areas of stockpiled topsoil material.

S610-3.13 Clean-up and Repair

Within 72 hours of having completed any of miscellaneous landscape operations, or of having received written notification of any damage, clean and/or repair all adjacent surfaces to treated areas that have become messed-up or otherwise damaged by Contractor's ongoing operations. This includes but is not limited to removing all over-spray or scattered materials.

S610-4 METHOD OF MEASUREMENT

S610-4.01 Turf Establishment, Limestone

Quantity to be measured for payment will be number of square feet of surface area treated.

S610-4.02 Shredded Bark Mulch and Pea Stone

Quantity to be measured for payment will be number of cubic yards of material placed.

S610-4.03 Development Site Preparation

Quantity to be measured for payment will be on lump sum basis for each site.

S610-4.04 Water

Quantity to be measured for payment will be measured in thousand (1,000) gallon units of water applied, as determined by use of water meters, or by meters attached to water tanks/trucks.

S610-5 BASIS OF PAYMENT

S610-5.01 Hydroseeding and Seeding

Unit price bid includes cost of: notifications; surface preparation; removal and disposal of undesirable materials; grading; furnishing and applying soil amendments, seed, hydromulch, straw mulch, mulch tackifier, fertilizer, weed killer; watering; testing; permits, hydrant water meter, backflow prevention; mowing; site maintenance and protection; repair of treated areas until acceptance of resulting turf; and furnishing all labor, material, and equipment necessary to complete work.
No payment will be made under this work until an acceptable turf area has been satisfactorily produced throughout total project area, or in case of multi-street project, along an individual street segment. Acceptance of turf will be based upon having achieved performance criteria as specified in Subsection S610-3.09 Performance Acceptance Measures.

S610-5.02 Shredded Bark Mulch and Pea Stone

Unit price bid includes cost of: surface preparation; removal and disposal of undesirable materials; grading; weed barrier fabric; furnishing and placing shredded bark mulch/pea stone; watering; protection; and furnishing all labor, material and equipment necessary to complete work.

S610-5.03 Development Site Preparation

Lump sum price bid includes cost of: shaping and grading development site; stockpiling stripped topsoil material; trimming, shaping and maintaining stockpiles; furnishing, placing and maintaining weatherproof material/hydroseed; furnishing, placing, staking and maintaining straw bales; watering; finish grading, compacting and maintaining ground areas; eliminating irregular areas; filling in low spots; removal and disposal of undesirable materials; and furnishing all labor, material and equipment necessary to complete work.

Additional topsoil material supplied will be paid for under separate bid item.

S610-5.04 Limestone

Unit price bid includes cost of: furnishing and applying limestone; and furnishing all labor, material and equipment necessary to complete work.

S610-5.05 Water

Unit price bid includes cost of: furnishing and applying water; and furnishing all labor, material and equipment necessary to complete work.

Payment will be made under:

Note: XX in bid item number represents each individual development site. i.e.: S610.0901 Development Site Preparation (Clarissa Street).

ITEM NO.	ITEM	PAY UNIT
S610.0502	Hydroseeding	Square Foot
S610.0602	Seeding	Square Foot
S610.07	Shredded Bark Mulch	Cubic Yard
S610.08	Pea Stone	Cubic Yard
S610.09XX	Development Site Preparation (Site)	Lump Sum
S610.10	Limestone	Square Foot
S610.11	Water	1000 Gallons

REVISED March 5, 2015

SECTION S610 – LANDSCAPE WILDFLOWERS

S610 GENERAL

Purpose of this directive is to designate certain City of Rochester bid items for use on all City Projects.

For this directive, requirements of the City of Rochester Section S610, Landscape of *Standard Construction Contract Documents, 1991, update S610, Landscape, updated March 5, 2015.*

This directive only updates only the item numbers listed below and does not update or revise items listed under Basis of Payment in City of Rochester section S610.

S610-1 DESCRIPTION

Add: Work consists of establishment and maintenance of turf in lawn areas, wildflower planting, and miscellaneous treatment of planting areas as required in the Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with NYSDOT Standard Specifications (US Customary Units dated May 1, 2008) edition, including any addenda.

S610-2 MATERIALS

S610-2.12 Wildflower Establishment

Contractor must provide following certifications to Project Manager:

- Certification statement from wildflower seed mixture vendor stating botanical and common names, percentage by weight, and percentage of purity and germination for each species provided in mixture
- Certification statement from material manufacturer for herbicides and any other product required for establishment, including instructions for proper application method for each product.
- Certification statement from material manufacturer for mulch and tackifier

Work shall consist of ground preparation, furnishing and placing wildflower seeding materials and caring for wildflower areas in accordance with the contract documents and as directed by the Project Manager.

S610-2.13 Wildflower Seed Mixture

Seed is to be fresh, clean or new crop seed. Seed supplied is to be re-cleaned and of the latest crop. Seed mixture is to contain no more than 0.10 percent poa annua, is to be free of noxious weed seed, and is to be composed of varieties listed on the drawings or approved equivalent. Seed mixture is to be composed to specified species proportions by weight, and tested to minimum percentages of purity and germination. Percentage of purity is to be no less than 95% and germination of wildflower seed mixture is to be no less than 65%. All seed shall be free from noxious weeds and undesirable plants. Seed mix shall be cold stratified. All plant seed shall be delivered in sealed standard size bags of the vendor showing weight, analysis, and name of vendor. Seed shall be stored in a manner that not imped the health of the seed. Seed which has become wet, moldy, or damaged in transit or storage will not be accepted.

Equivalent seed varieties proposed for use are to have been tested by an independent or New York State certified testing organization, and have shown average or better performance under low maintenance conditions in northeastern region of United States.

S610-3 CONSTRUCTION DETAILS

S610-301 General

Minimum of 14 days prior to commencing work, written schedule of planned operations for **Add: wildflower seeding/reseeding,** seeding/reseeding of lawn areas, application of fertilizers and weed killers is to submitted to Project Manager for approval. Such written schedule is also to include specific methods and materials to be used. At least 5 days prior to application, written notice is to be provided to Project Manager and residents of intent to apply grass seed, turf mulch and mulch tackifier, fertilizers and/or weed killers. Written notice to residents is to be in format as approved of by Project Manager.

Do not apply weed killer at locations where resident objects to such application of weed killer.
Existing surface areas are to be free of all undesirable material which is larger than 1 inch in its greatest dimension. Such undesirable materials are, but not limited to: refuse; paving materials such as concrete, asphalt, brick; materials which are toxic to plant growth and grass seed; subsoil; woody vegetation, stumps, roots, brush; clods, hard lumps, and rocks. Sod and herbaceous growth such as grass and weeds need not be removed from existing soil, but are to be thoroughly broken up and mixed into overall soil material. All embedded foreign objects are to be removed and resultant hole filled-in with topsoil material. Contractor is to remove and dispose of any undesirable materials prior to treating surface area.
Existing surface is to be regraded as necessary to be uniform in contour and to meet required grades and cross-slopes without any irregularities. Finished grades and cross-slopes are to be uniformly sloping between tops of adjacent features such as sidewalks, driveways, curbs, or other existing lawn areas. Final surface contour is to be checked for accordance to required grades and cross-slopes by use of surveying instruments or other method as approved by Project Manager. Eliminate irregularities which form low areas and may tend to pond water when regrading, or by filling-in low area with either topsoil or embankment in place material.
Excavation and disposal is to be in accordance with NYSDOT Section 203 Excavation and Embankment. Properly dispose of all excavated material off site within 24 hours. Stockpiling of excavated material at project site is not allowed.
Buildings, paved areas, plantings and other non-seeded areas are to be protected from any excessive over-spray of any of materials that are being applied.

S610-3.14 Surface Preparation for Wildflower Establishment

Finished surface is to be flush with, or not greater than ¼ inch above finished surface of adjacent surfaces. Existing surface is to be prepared per Subsection S610-3.01 General.

Finished surface is to be uniform and smooth, and in accordance with required grades and cross-slopes. This may require that existing surface be regraded and hand raked. Topsoil material is to be used to adjust existing surface to require degree of smoothness and uniformity.

If additional topsoil material is required, surface is to be properly prepared to ensure cohesiveness between materials. Tops and bottoms of all slopes are to be rounded to blend into each other and into existing adjacent surface areas so as not to leave any noticeable sharp breaks. Undesirable materials are to be removed and properly disposed of off-site.

Prior to seeding the topsoil is to be tracked or furrowed. Acceptable mechanical methods are using a crawler or rubber tired tractor to make depressions and firm loose soil. Depressions in the soil are to be perpendicular to the slope to prevent erosion and seed washing down the slope. Firm but not compacted soil will provide seed to soil contact and prevent the soil from drying too quickly. Soil is over compacted if a piece of rebar cannot be pressed by hand 3" into the soil. Over compacted topsoil will require spreading 2" of compost over the compacted area and rototilling the compost in to a depth of 6" at no additional cost to the City.

S610-3.15 Wildflower Establishment

A. General
   Utilize all measures as may be necessary to produce finished product that provides continuous blanket of wildflowers.
B. Hydroseeding
   Clean the hydroseeding tank prior to use. A submittal is required of the hydroseed slurry mix. The mix will not provide liquid fertilizer. The mix will limit the mulch. (Fertilizer will promote the growth of weeds over the seed mixes and excess mulch will prevent seed germination.) Use hydromulcher (sprayer) and apply materials in accordance with manufacturer's recommendations. Hydroseed slurry will be applied in two steps. 1/3 of the hydroseed slurry is to have the wildflower seed added and mixed for a minimum of 10 to a maximum of 20 minutes. Hydroseed slurry is to be applied at a rate of application sufficient to meet required performance criteria, but not less than following:
   Seed – rate as specified on drawings
   Wood fiber mulch – 500 pounds per acre
   Mulch tackifier – rate recommended by manufacturer
   Step two is to apply 2/3 of the hydroseed slurry without the wildflower seeds at the rate of application sufficient to meet required performance criteria, but not less than the following:
   No Seed
   Wood Fiber Mulch – 1000 pounds per acre
   Mulch tackifier – rate recommended by manufacturer

C. Biodegradable class II, Type D (intermediate) rolled erosion control products and soil stabilizers (NYSDOT Item no. 713-07) from the NYSDOT technical services approved materials list will need to be applied after the hydroseeding application per the manufacturer's recommendations for slopes steeper than 3:1. Follow-up seeding applications will be made to cover areas that have not germinated. Seed germination should be evident within 2 months after application.

D. Wildflower Maintenance – First Growing Season
Whenever the overall vegetation reaches a height of 24" the vegetation should be mowed to a height of 8". Mowing should occur no later than September 15th and resume in the spring. Problem weeds should be spot treated either by hand pulling or by approved herbicide application. If herbicides are used follow-up seeding application is required after the residuals from the herbicide break down. Some herbicides prevent seed germination. Note: Very few plants will flower and set seed in the first growing season. Between April 1st and November 15th, in the absence of 1 inch of rainfall within 5 consecutive calendar days, the contractor is responsible for supplying and apply water to the seeding area once per week, except during July and August, when water will be applied twice per week, with a minimum of 2 days between applications.

E. Wildflower Maintenance – Second Growing Season
If heavy infestations of weeds are prevalent in the second growing season then the vegetation is to be mowed to a height of 8". Mowing to be completed by the contractor from April 1 to no later than September 15th.

S610-3.16 Performance Acceptance Measures

Only wildflowers that demonstrate that they have achieved required growth and quality characteristics as outlined in this specification to satisfaction of Project manager, will be accepted by City. Factors for assessing wildflowers will include, but not be limited to: topsoil pH; texture, height and density of growth; overall coverage of areas designated for seeding; absence of undesirable species, weeds, molds, mosses, algae, lichens, disease, and other undesirable characteristics; and uniformity of slope and overall drainage of surfaces.

S610-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S610.1701	Landscape: Wildflower Seed Mix Willow Pond	SF
S610.1702	Landscape: Wildflower Seed Mix Steep Slopes	SF
S610.1703	Landscape: Wildflower Seed Mix Swales	SF

LAG (date)

SECTION S611 - PLANTING

S611-1 DESCRIPTION

Work consists of furnishing and planting trees, shrubs, vines and ground cover as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

Hereinafter, in general trees, shrubs, vines and ground cover will be referred to as plant materials.

S611-2 MATERIALS

S611-2.01 General

Plant materials are to be purchased directly from nursery growers located within east coast to mid-west regions of United States to ensure compatibility with local climatic conditions. Listing of nursery(s), including contact person, from which plant materials are being purchased is to be supplied to Project Manager within 14 calendar days of purchasing plant materials.

Plants are to be true to botanical name, grown in nurseries in USDA Zone 5 or colder and must meet standards of American Standard for Nursery Stock, latest edition as published by American Association of Nurserymen (AAN) of Washington, D.C.

Prior to delivery of plant materials to project site, City reserves right to inspect plant materials at nursery which are tagged for installation, and prior to digging of such plant materials. Plant materials which do not meet standards of quality and uniformity will be rejected. Such inspection and rejection may occur at nursery and/or project site. City will inspect replacement plant materials to ensure that they meet standards of quality and uniformity.

Balled and burlapped plants are to be freshly dug. Heeled-in or cold-storage plants will be accepted only with prior written approval from City. Manufactured, cracked or broken root balls are not acceptable.

Plant sizes are minimum size required, and plants will be accepted at larger sizes specified providing plants meet requirements of AAN standards of size and quality. Plants are to be live, healthy, and vigorous, free of disease, insect pests and their eggs and larvae. Plants are to be free of physical damage such as scrapes, broken or split branches or canes, unhealed scars, bark abrasions, sun scalds, fresh limb cuts, disfiguring knots, or any other defects.

Plants stored temporarily at nursery or at Contractor's site are to be properly heeled-in, protected from injury, and properly cared for to maintain plant's life, health, and vigor.

Container grown plants are to have been grown in container long enough for new fibrous roots to develop so that root ball is firm and will retain its shape and hold together when removed from container. Containers are to be sufficiently rigid and sound to hold root ball shape and protect root ball during shipping and handling.

Balled and burlapped plants are to be dug immediately before shipment, and properly dug and protected to preserve natural earth which is in contact with roots. Plants are to have labels securely attached indicating nursery of origin, plant size, and plant identification.

Tarpaulins or other covers are to be placed over plants being transported by open truck or open freight car to prevent wind damage and desiccation. Closed trucks and boxcars that are used for transportation of plants are to be adequately ventilated to prevent sweating.

S611-2.02 Trees

Trees are to be specimen quality trees grown for street tree usage with single strong central leaders for minimum of 3/4's of overall tree height. Trees are to have outstanding form, being symmetrical, heavily branched with even branch distribution and straight trunks, and densely foliated when in leaf. Trees are to possess normal balance between height and spread.

Tree caliper is to be 3 to 3-1/2 inches. Branching height for trees is to begin no lower than 6 feet from grade for major tree species, and 4 feet from grade for minor tree species, as measured at nursery.

Tree roots are to be balled and burlapped. Usage of wire baskets for balling tree roots is acceptable, but only natural burlap and jute twine may be used for wrapping root ball. Bare root tree stock is unacceptable.

Trees are to have well developed fibrous root system typical of their species. Trees are not to be pruned at or by nursery at any point during digging, loading and delivery process. Trees vegetative crown is to be securely tied prior to shipping to prevent damage.

S611-2.03 Shrubs

Shrubs are to be matched specimens from single block source.

Shrubs may be either container grown material or balled and burlapped. Bare shrub root materials will be accepted only with prior written approval from City.

S611-2.04 Vines and Ground Cover

Vines are to be of size specified and trained on vertical lattice or other framework, unless otherwise specified.

Ground cover plants are to be minimum 2 years old and well rooted.

S611-2.05 Planting Medium

Non-native planting medium is to consist of 80 percent coarse sand and 20 percent soil material by volume.

Soil material is to be natural, fertile, friable soil typical of region. Soil material is to be from surface layer of soil, free of undesirable materials which are larger than 1 inch in its greatest dimension. Types of undesirable materials are, but not limited to: refuse; paving materials such as concrete, asphalt, brick; materials which are toxic to plant growth and grass seed; subsoil; woody vegetation, stumps, roots, brush; clods, hard lumps, and rocks. Sod and herbaceous growth such as grass and weeds need not be removed from soil material, but are to be thoroughly broken up and mixed into overall soil material. Soil material is to contain between 3 and 6 percent of natural organic matter as determined by loss on ignition of moisture-free samples dried and tested in accordance with current methods of Association of Official Agricultural Chemists.

Soil material is to meet following requirements:

- Acidity range between 6.0 to 7.2 pH inclusive
- Fertility rate high in natural nutrients or amended to acceptable levels, as based on Cornell Soil Test
- Should tests and analysis indicate that soil material is deficient in any requirements, system of amelioration is to be proposed for approval

Soil material is to be tested prior to acceptance and placement. Testing is to be done by an approved independent testing laboratory, or by an agriculture unit of State university system. Representative sample of soil material is to be provided minimum of 21 days before use, to testing laboratory for analysis to allow sufficient time for testing. Test reports are to contain specific recommendations for amelioration including types of additive and fertilizer, and composition and rate and means of application, based upon soil test results and type of plant material to be planted.

At minimum, analysis is to include:

- Percent organic content
- Soil pH
- Percent clay, silt, sand particles, and fractionation
- Nutrient analysis

Soil material approved for use is to be stockpiled so as not to be mixed with other fill materials. Amelioration recommendations are to be followed during planting operations.

S611-2.06 Structural Soil

Structural soil is to be three component mix consisting of crushed stone, soil, and hydrogel, meeting following mix proportion:

Component	Percent by Dry Weight
Crushed Stone	80%
Soil	20%
Hydrogel	0.03%

Total optimum moisture at mixing should be 10 percent in accordance with AASHTO T 99 (ASTM D 698).

Crushed stone is to be highly angular granite or sandstone, without any fines, meeting following gradation requirements:

Screen Size	General Limits Percent Passing by Weight
1-1/2 inch	100%
3/4 inch	0%

Soil is to be loam to heavy clay loam in accordance with USDA soil classification system, with minimum of 20 percent clay. Organic matter should range between 2 percent and 20 percent.

Hydrogel is used as tackifier to prevent separation of crushed stone and soil during mixing and installation. Hydrogel is to be non-toxic, non-phytotoxic, natural or synthetic polymer, such as Gelscape as manufactured by Amereq Corporation; Soilmoist as manufactured by JRM Chemical Inc.; Supersorb as manufactured by Aquatrols Corporation; or approved equivalent.

S611-2.07 Curbed Planting Bed

A. General

Curbed planting bed composition and plantings will be as specified in Contract Documents.

B. Planting Soil

Non-native planting soil is to consist of 60 percent soil, 20 percent builder sand and 20 percent well decomposed compost material by volume. Soil is to be in accordance with Subsection S611-2.05 Planting Medium.

C. Mulch

Mulch is to be in accordance with Subsection S611-2.09 Mulch.

D. Geotextile Fabric

Geotextile fabric is to be in accordance with Subsection S611-2.10 Geotextile Fabric.

E. Stone Curb

Stone curb is to be either medina stone, blue stone or granite stone in accordance with Section S609 Curb. Width will be as specified in Contract Documents

F. Concrete Curb

Concrete curb is to be in accordance with Section S609 Curb.

S611-2.08 Sump Stone

Sump stone is to be underdrain filter material in accordance with requirements of Section S605 Underdrain.

S611-2.09 Mulch

Mulch is to be well shredded hardwood, maximum 1/2 to 1 inch in size, partially decomposed, free of disease and debris, with no green leaf matter or sprouts.

S611-2.10 Geotextile Fabric

Geotextile fabric is to be 100 per cent staple polyester and polypropylene non-woven needle-punched geotextile fabric designed for long-term passage of water, as per AEF 480HS as manufactured by American Engineering Fabrics Inc., FX-40HS as manufactured by Carthage Mills, 140NC as manufactured by Mirafi/TenCate, or approved equivalent.

S611-3 CONSTRUCTION DETAILS

S611-3.01 General

Planting seasons for deciduous plants is between March 15th and May 15th, and between October 15th and December 1st. No planting is to take place between December 2nd and March 14th.

Deciduous plants may be planted between May 16th and October 14th only with prior approved by Project Manager, and require weekly watering until final acceptance.

No planting is to be done in frozen soil, or soil in an unsatisfactory working condition.

Rocks or other underground obstructions encountered during excavation are to be removed to depth necessary to permit planting, or planting site moved to another location, as directed by Project Manager.

City will inspect all plants on Project site prior to their being planted. City reserves right to reject plants that are not in accordance with these specifications. Rejected plants are to be replaced in-kind with plants that are in accordance with these specifications.

S611-3.02 Preparation and Planting

A. General

Mark and outline limits of planting areas before commencing any digging operations, and completely clean planting area of debris, grass, weeds and other forms of vegetation. Removed debris and other undesirable excavated materials are to be properly disposed of off-site.

Excavate entire planting pit to minimum of twice diameter of root ball, and stockpile excavated material on-site for possible reuse as backfill material.

Plants are to be set plumb in all directions and at such level that after settlement, it bears same relationship to surrounding grade as it originally did before being transplanted. Plants are to be centered in planting pit on undisturbed subgrade material, or on well compacted backfill material.

Prior to backfilling planting pit, top half of root ball is to be exposed. Wire basket is to be cut or bent back, burlap and twine is to be cut and removed or peeled back. Bottom half of root ball is to remain contained, do not completely remove wire basket or burlap and twine from entire root ball. Synthetic fabric and/or synthetic rope is to be completely removed from entire plant.

Girdling and/or encircling roots on potted plants are to be loosened or cut.

Backfill planting pit with planting medium, or acceptable excavated material. Before excavated material can be reused for backfill, it is to be thoroughly cleaned of debris that is greater than 1 inch in diameter. Backfill is to be placed in multiple layers, 4 to 6 inches thick, thoroughly watering-in each successive layer to remove any air pockets.

B. Tree Planting Grass Area

Tree is to be set at such level that after settlement, top of root ball is 2 to 3 inches below finished grade. Backfill remaining planter pit area with planting medium, and minimum of 3 inches of mulch.

C. Tree Planting Paved Area

1. *Tree Planting Paved Area – Stone/Brick Pavers.* Drainage sumps are to be provided in accordance with Subsection S611-3.02C5 Sump Installation. Tree is to be set at such level that after settlement, top of root ball is 1 to 2 inches below bottom of stone/brick pavers. Place geotextile fabric over entire opening of tree pit area, leaving an opening for tree trunk. Backfill remaining tree pit area with sand and stone/brick pavers in accordance with Section R616 Tree Planter.

2. *Tree Planting Paved Area – Tree Grate.* Drainage sumps are to be provided in accordance with Subsection S611-3.02C5 Sump Installation. Tree is to be set at such level that after settlement, top of root ball is 2 to 3 inches below bottom of tree grate. Place geotextile fabric over entire opening of tree pit area, leaving an opening for tree trunk. Backfill remaining tree pit area with pea stone or mulch up to bottom of tree grate. Tree grate is to be installed in accordance with Section R616 Tree Planter.

3. *Tree Planting Paved Area – Mulch.* Drainage sumps are to be provided in accordance with Subsection S611-3.02C5 Sump Installation. Tree is to be set at such level that after settlement, top of root ball is 2 to 3 inches below finished grade. Place geotextile fabric over entire opening of tree pit area, leaving an opening for tree trunk. Backfill remaining tree pit area with minimum of 3 inches of mulch.

4. *Tree Planting Paved Area – Flexible Porous Product.* Tree is to be set at such level that after settlement, top of root ball is 2 to 3 inches below finished grade. Place flexible porous product over entire opening of tree pit area up to finish grade, leaving 3 to 4 inch opening around tree trunk. Flexible porous product is to be installed in accordance with Section S409 Flexible Porous Product.

5. *Sump Installation.* Drainage sumps can be constructed by excavating with an auger, post hole digger, or other such device. Drainage sump excavations are to be completely filled with underdrain filter material. After drainage sump excavations are completely filled, cover bottom of tree pit area, including drainage sumps, with geotextile fabric.

D. Tree Pit - Plantings by Others

Construct tree pit in accordance with Subsections S611-3.02 Preparation and Planting. Trees will be supplied by and planted by others.

E. Shrubs

Shrubs are to be set at such level that after settlement, top of root ball is 2 to 3 inches below finished grade. Backfill remaining planter pit area with planting medium, and minimum of 3 inches of mulch.

F. Vines and Ground Cover

Place 1-1/2 to 2 inches of peat moss over planting bed material, and thoroughly saturate with water. Rototil planting bed area until saturated peat moss is thoroughly and uniformly blended with and into top 3 inches of planting bed material.

S611-3.03 Curbed Planting Bed

Curbed planting bed composition and plantings will be as specified in Contract Documents.

Mark and outline limits of curbed planting bed area before commencing any digging operations. Excavate entire area of curbed planting bed to minimum depth of 2.50 feet below finished grade, removing all materials. Excavated materials are to be removed and properly disposed of off-site in accordance with NYSDOT Section 203 Excavation and Embankment.

Curb is to installed in accordance with Section S609 Curb.

Plantings are to be set at such level that after settlement, top of root ball is 2 to 3 inches below finished grade. Plants are to be set and planted in accordance with Subsections S611-3.02B Tree Planting Grass Area, S611-3.02F Shrubs and S611-3.02G Vines and Ground Cover, for types of plants to be planted.

Backfill excavation with planting soil to within 3 inches of top of curb. Backfill is to be placed in multiple layers 4 to 6 inches thick, thoroughly watering-in each successive layer to remove any air pockets.

If required, place geotextile fabric over entire opening of curbed planting bed area and on top of planting soil, leaving 3 to 4 inch opening around each plant. Finish curbed planting bed with minimum of 3 inches of mulch, evenly spread over entire planting box area. Mulch is not to extend over top of curb.

S611-3.04 Structural Soil

Structural soil is to be prepared and installed in accordance with manufacturer's instructions.

Typically structural soil components are delivered to site, and are mixed in batches as material is required for placement. Structural soil mix is to be mixed until uniform blend is produced. Structural soil mix is placed in lifts not exceeding 6 inches in thickness prior to compaction, and compacted to not less than 95 percent of standard Proctor density.

Structural soil is to be at or near optimum compaction moisture content in accordance with AASHTO T 99 (ASTM D 698), and is not to be placed in frozen, wet or muddy excavations.

Structural soil is to be protected from exposure to excess water and from erosion at all times. Do not stockpile or store structural soil, unless it is properly covered and protected with waterproof covering. Excess water that is introduced into structural soil after grading, is to be allowed to drain until optimum compaction moisture content is reached.
Excavate and compact proposed subgrade to depths, slopes and widths as required. Areas to receive structural soil are to be inspected by installer before starting work, and all defects such as incorrect grading, compaction, and inadequate drainage are to be reported to Project Manager and corrected before placing structural soil.

Excavation area is to be clear of all construction debris, trash, rubble and any other foreign material. In event that fuels, oils, concrete washout silts or other material harmful to plants have been spilled into subgrade material, excavate and remove contaminated subgrade material. Fill any over excavation with approved fill and compact to required subgrade compaction.

Do not proceed with placement of structural soil until all utility work in excavated area has been finished.

Clean up all trash and any soil or dirt spilled on any paved surface at end of each working day.

S611-3.05 Pruning

Pruning is to be limited only to those branches which are dead, damaged, weak, diseased, insect infested, rubbing against another branch, cross over another branch, or have tight branching angle or sucker growth. Pruning can also be done to reshape plant to improve overall shape or silhouette of plant by thinning or removing unnecessary branches. Use sharp clean pruning tools to cut branch, with final cut being made at branch collar. When heading is necessary, final cut is to be to lateral branch that is 1/3 to 1/2 diameter of branch to be removed.

S611-3.06 Mulch

Minimum of 3 inches of mulch is to be spread evenly to required thickness over entire planting area.

S611-3.07 Wrapping

Wrapping is not permitted unless otherwise specifically specified in Contract Documents.

S611-3.08 Fertilizer

Plantings are to be treated with slow release nitrogen fertilizer at manufacturer's recommended rates, and thoroughly watered in. Type of fertilizer to be used is to be as approved by Project Manager prior to application.

S611-3.09 Restoration

Areas disturbed by planting operations are to be restored in-kind. Excess backfill material is to be disposed of off-site.

S611-3.10 Care - Trees

Care of trees is to begin immediately after each tree is planted and is to continue for period of 2 years from date of planting. Care of trees is to include watering, pruning, fertilizing, and other reasonable means of ensuring that tree remains live, viable, and vigorous. At end of 2 year care period Contractor is to completely remove all staking and guying materials, and cease care.

If City determines that any tree has failed and is not live, viable or vigorous at any time during 2 year care period due to lack of proper installation or care, Contractor is to replace failed tree during next available planting season with new tree in accordance with these specifications. Contractor is to then care for new tree planting for an additional period of 2 years. At end of additional 2 year care period Contractor is to completely remove all staking and guying materials and cease care.

S611-3.11 Care – Shrubs, Vines and Ground Covers

Care of shrubs, vines and ground covers is to begin immediately after each plant is planted and is to continue for period of 1 year from date of planting. Care is to include watering, pruning, fertilizing, and other reasonable means of ensuring that plants remain live, viable, and vigorous. At end of 1 year care period Contractor is to completely remove all staking and guying materials, and cease care.

If City determines that any plant has failed and is not live, viable or vigorous at any time during 1 year care period due to lack of proper installation or care, Contractor is to replace failed plant during next available planting season with new plant in accordance with these specifications. Contractor is to then care for new plant for an additional period of 1 year. At end of additional 1 year care period Contractor is to completely remove all staking and guying materials and cease care.

S611-3.12 Warranty

Trees are to be warranted for period of 2 years from date of planting against failure due to lack of proper installation and care as outlined in Section S611-3 Construction Details.

Shrubs, vines and ground cover plants are to warranted for period of 1 year from date of planting against failure due to lack of proper installation and care as outlined in Section S611-3 Construction Details.

S611-4 METHOD OF MEASUREMENT

S611-4.01 Plantings

Quantity to be measured for payment will be number of plants installed.

S611-4.02 Curbed Planting Bed

Quantity to be measured for payment will be number of square feet of curbed planting bed constructed, by measuring top surface area of curbed planting bed.

S611-4.03 Planting Medium and Structural Soil

Quantity to be measured for payment will be number of cubic yards installed.

S611-5 BASIS OF PAYMENT

S611-5.01 General All Items

Unit price bid for all items includes cost of: inspection; layout; excavation; removing and disposing obstructions, debris, rubble, sod and other vegetation; ground preparation; furnishing, installing, pruning, wrapping and caring for plant; removing and disposing wire baskets, burlap, twine, rope and synthetic material; furnishing and installing backfill material, soil amendments, mulch, fertilizer, water, stakes, wire and webbing; replacement and additional care of any failed plant; and furnishing all labor, materials, and equipment necessary to complete work.

S611-5.02 Tree Planting Paved Area

Unit price bid also includes cost of: planting medium; mulch; sump installation; furnishing and installing underdrain filter material and geotextile fabric.

Furnishing and placing of stone/brick pavers, tree grates, and flexible porous product will be paid for under separate bid items.

S611-5.03 Tree Planting Paved Area – at Existing Tree Pit

Unit price bid also includes cost of: excavation; removing and disposing existing plant, backfill, fabric, left over guying materials; planting medium; sump installation; furnishing and installing underdrain filter material and geotextile fabric.

S611-5.04 Vines and Ground Cover

Unit price bid also includes cost of: furnishing and installing peat moss; planting medium; and rototiling.

S611-5.05 Tree Pit - Plantings by Others

Unit price bid includes cost of: excavation; removing and disposing obstructions, debris, rubble, sod and other vegetation; ground preparation; sump installation; furnishing and installing underdrain filter material and geotextile fabric; furnishing and installing planting medium, soil amendments; mulch; and furnishing all labor, materials, and equipment necessary to complete work.

Furnishing and placing of stone/brick pavers, tree grates, and flexible porous product will be paid for under separate bid items.

S611-5.06 Curbed Planting Bed

Unit price bid includes cost of: excavation; removing and disposing all excavated materials; furnishing and installing curb, planting soil, soil amendments, mulch; furnishing and installing geotextile fabric if required; and furnishing all labor, materials, and equipment necessary to complete work.

Furnishing and installing plantings for curbed planting bed will be paid for under bid Items S611.04XX Tree Planting, S611.07XX Shrub Planting, and S611.08XX Vines and Ground Cover.

S611-5.07 Planting Medium and Structural Soil

Unit price bid includes cost of: excavation; removing and disposing all excavated materials; furnishing, preparing and installing planting medium or structural soil; soil amendments; stockpiling; waterproof covering; protection; and furnishing all labor, materials, and equipment necessary to complete work.

S611-5.08 Excavation

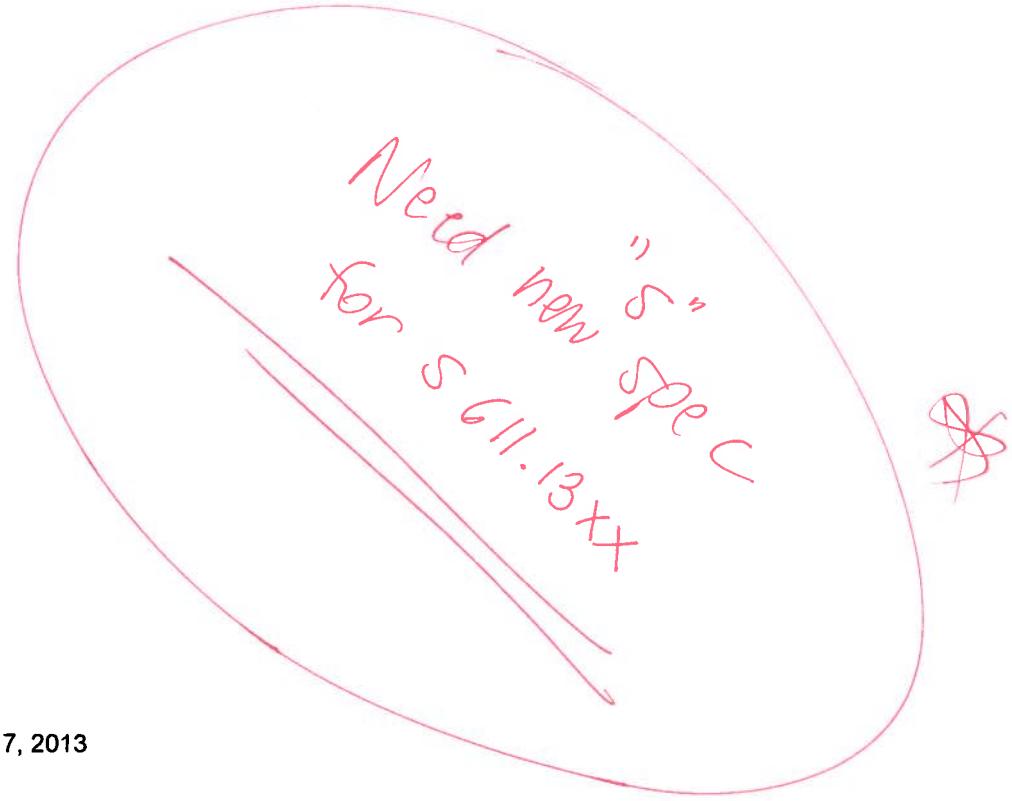
Excavation will be measured from top of existing surface at time of excavation.

Excavation that is included in pay item does not include rock excavation. Rock excavation will be paid for under separate bid item.

Payment will be made under:

Note: XX in bid item number represents each individual species of planting. i.e.: Kwanzan Cherry tree would be bid as S611.0401 Tree Planting (Prunus Serrulata "Kwanzan" - Kwanzan Cherry).

ITEM NO.	ITEM	PAY UNIT
S611.04XX	Tree Planting (species)	Each
S611.05XX	Tree Planting Paved Area (species)	Each
S611.06XX	Tree Planting Paved Area - at Existing Tree Pit (species)	Each
S611.07XX	Shrub Planting (species)	Each
S611.08XX	Vines and Ground Cover (species)	Each
S611.09	Tree Pit - Plantings by Others	Each
S611.1001	Curbed Planting Bed	Square Feet
S611.11	Planting Medium	Cubic Yard
S611.12	Structural Soil	Cubic Yard



REVISED July 17, 2013

SECTION S613 - TOPSOIL

S613-1 DESCRIPTION

Work consists of furnishing and placement of topsoil as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

S613-2 MATERIALS

S613-2.01 Topsoil

Topsoil material is to be natural, fertile, friable soil typical of local region. Topsoil material is to be surface layer of soil, and is to be free of all undesirable material which is larger than 1 inch in its greatest dimension. Sod and herbaceous growth such as grass and weeds need not be removed from topsoil material, but are to be thoroughly broken up and mixed into overall topsoil material. Undesirable materials are but not limited to refuse; paving materials such as concrete, asphalt, brick; materials which are toxic to plant growth and grass seed; subsoil, woody vegetation, stumps, roots, brush, clods, hard lumps, stones and rocks.

Topsoil material is to have pH range of between 6.0 and 7.5, organic content of between 2 and 20 percent (dry weight basis), and is to meet following gradation requirements:

Screen Size	Percent Passing by Weight
2 inch	100%
1 inch	85 to 100%
1/4 inch	65 to 100%
#200	20 to 80%

Submit certification statement from topsoil supplier stating existing pH level, percentage of organic content and gradation. If necessary certification is to also state any recommendations on usage of amendments required to produce topsoil material conforming to required pH range. Topsoil material amendments that are to be used for adjustment of soil chemistry are to be standard commercial type including but not limited to ground limestone; gypsum; products containing phosphorus, potassium, sulphur, et cetera.

Limestone is to be standard, pulverized commercial type having minimum total neutralizing value of 88 percent calcium carbonate equivalence, which is to be applied at rate sufficient to bring existing pH of topsoil material to required range of 6.0 to 7.5, as determined by testing.

S613-2.02 Stockpiling and Testing

Topsoil material may be acquired from previously approved site that is designated in Contract Documents. If no such previously approved site has been designated, Contractor is to notify Project Manager of intended source of topsoil material minimum of 21 days prior to scheduled use to allow for sampling and testing of topsoil material. Topsoil material is to come from stockpile that contains at least 200 cubic yards of topsoil material, is at least 4 feet high, and is trimmed, shaped and maintained to uniform surfaces and slopes.

S613-2.03 Rejection/Acceptance of Topsoil Material

Topsoil material which does not conform to material requirements, receives any unsatisfactory test result, contains any undesirable foreign material; has offensive or objectionable overpowering odor, or lacks certification statement from supplier, will be rejected.

Acceptance of topsoil material will be based upon satisfactory test results, absence of any offensive or objectionable overpowering odor, and receipt of supplier's certification statement.

Project Manager will notify Contractor in writing that topsoil material has been rejected, or accepted for use.

S613-3 CONSTRUCTION DETAILS

S613-3.01 General

Where Contractor is required to place topsoil material on existing surface that has been prepared by others, Contractor is to notify Project Manager in writing if existing surface is unsuitable for placement of topsoil material. Appropriate action is to be taken to rectify condition of existing surface before placing any topsoil material.

S613-3.02 Tree Protection

Contractor is to protect all existing trees and tree roots within project limits from damage by construction activities. Contractor is not to place or stockpile any construction or excavated materials within limits of canopy of any existing tree to prevent smothering of existing tree's root system. Vehicles and other construction equipment are not to be parked on any tree root system, nor left running (idling) under limits of canopy of any existing tree.

Where cutting of existing tree roots is necessary, it is to be done with sharp cutting tools. Exposed tree roots are to be re-buried as soon as possible. Until exposed tree roots can be re-buried, exposed tree roots are to be covered with wet burlap. Burlap is to be kept wet until exposed tree roots can be re-buried.

Existing trees that are damaged by construction activities are to be repaired within 72 hours using current arboricultural standards. Those existing trees that are determined by City Forester to be damaged beyond repair, are to be removed and replaced by Contractor.

Topsoil that is placed around an existing tree is not to be placed any higher than 3 inches of original surface area at base of existing tree.

S613-3.03 Soil Amendments

If required, soil amendments are to be applied according to manufacturer's instructions for safe and effective application, and at rate sufficient to bring chemistry of topsoil material to required pH range.

During turf establishment, City may have further tests done on topsoil material. Any topsoil material which is not in accordance is to be further treated with amendments or replaced with new topsoil material.

S613-3.04 Surface Preparation

Existing surface is to be re-graded as necessary to be uniform in contour, to meet required grades and cross-slopes, and to be free of irregularities. Finished grades and cross-slopes are to be uniformly sloping between adjacent features. Final surface contour is to be checked for accordance to required grades and cross-slopes by use of any approved method. Irregularities which form low areas and may tend to pond water are to be eliminated when existing surface is re-graded. If necessary, low areas that cannot be eliminated by re-grading are to be filled in with topsoil material.

Existing surface is to be culled of all undesirable material which is larger than 1 inch in its greatest dimension. Sod and herbaceous growth such as grass and weeds need not be removed from existing soil material, but are to be thoroughly broken up and mixed into overall soil material. Undesirable materials are but not limited to refuse; paving materials such as concrete, asphalt, brick; materials which are toxic to plant growth and grass seed; subsoil, woody vegetation, stumps, roots, brush, clods, hard lumps and rocks.

All embedded foreign objects are to be removed and resultant hole filled-in with topsoil material. All undesirable materials are to be removed and disposed of prior to treating surface area.

Excavation and disposal is to be in accordance with NYSDOT Section 203 Excavation and Embankment. All excavated material is to be properly disposed of off Project site within 24 hours of being excavated. Stockpiling of excavated material at Project site is not allowed.

S613-3.05 Compaction

After placement, topsoil material is to be compacted with approved lawn roller to minimize as much as possible any further settlement. If necessary after initial rolling, add additional topsoil material to fill-in any voids or depressions. Continue to compact and re-work topsoil material until finished surface area is uniform and meets required grades and cross-slopes.

S613-4 METHOD OF MEASUREMENT

Quantity to be measured for payment will be number of cubic yards of topsoil material placed, as computed in its final compacted state.

Measurement for payment based on delivery tickets of topsoil material is not acceptable.

S613-5 BASIS OF PAYMENT

Unit price bid includes cost of: furnishing, testing, amending, placing, compacting, grading topsoil material; surface preparation; grading; minor excavation; removal and disposal of all undesirable materials; survey and stakeout necessary to establish required elevations, grades and cross-slopes; tree protection; furnishing and installing necessary protection against pedestrian and vehicular traffic; re-work and correction of grades and cross-slopes; and furnishing all labor, material, and equipment necessary to complete work.

Minor excavation that is included in unit price bid for topsoil is defined as any general excavation that is less than 3 inch deep. Minor excavation is further defined as specific excavation area that is deeper than 3 inch but has contiguous surface area that encompasses less than 50 square feet and is necessary for preparation of surface area.

General excavation that is 3 inch or greater in depth, and specific excavation area that encompasses contiguous surface area that is larger than 50 square feet, will be paid for under separate bid item.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S613.03	Topsoil	Cubic Yard

REVISED March 3, 2015

SECTION S614 - CARE OF PLANTS

S614-1 DESCRIPTION

Work consists of pruning, transplanting, or removal of existing plants and stumps as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

S614-2 MATERIALS

None specified.

S614-3 CONSTRUCTION DETAILS

S614-3.01 General

Trunks, branches, rubbish and debris resulting from work is to be removed and disposed of in accordance with NYSDOT Section 201 Clearing and Grubbing.

Existing features within public right-of-way and private property immediately adjacent to public right-of-way are to be protected to limit any possible damage from occurring due to Contractor's operations. Any damage incurred while performing any work under this specification is to be immediately repaired.

Workers are not permitted to climb trees with climbing spurs, but are to employ other acceptable tree climbing methods. Only tools and methods of work that are acceptable are to be used. Cutting surfaces of all tools, ladders, ropes, soles of workers shoes and other objects coming into contact with plant are to be washed with approved disinfectant at start of any work on plant to prevent spread of any plant born disease. If in opinion of Project Manager, unsafe tools, equipment or methods are being used, work will be stopped until such unsafe conditions have been corrected.

S614-3.02 Pruning

All work is to be performed in accordance with ANSI Z133.1, ISA Tree Pruning Guidelines and as required by City Forester.

Existing plant is to be pruned of undesirable wood, and resulting crown re-shaped to natural habit of plant. Branches interfering with or hindering healthy growth of existing plant are to be removed. Diseased or dead branches are to be removed. Branches which may be partially dead, yet has healthy lateral branch at least 1/3 diameter of parent branch, are to be trimmed beyond healthy portion of branch, providing result does not prove to be unsightly in which case branch is to be completely removed. Stubs or improper cuts resulting from former pruning operations are to be removed.

Branches on existing plants that interfere with vehicular or pedestrian sight distance, traffic signs or street lights, are to be removed. Overhanging branches that are less than 16 feet above any part of roadway, or 7 feet above any part of sidewalk, are to be removed. Existing plants are to be additionally pruned so as to allow minimum lateral clearance along sidewalk of 12 inches.

Cuts are to be cleanly made with sharp tools as close to parent trunk or limb as possible, without disturbing callus collar. Large bark wounds are to be scar traced in accordance with good horticultural practice. Nails, spikes, wire or other foreign materials driven into or fastened to plant are to be either removed, or if approved cut flush in manner to permit complete healing over.

S614-3.03 Transplanting

Existing plants are to be transplanted in accordance with ANSI Z60.1 Transplanting. Transplanting is to be done by using tree spade of proper dimensions for size of plant which is to be transplanted.

Transplanted plants are to be planted at same depth as plant originally grew. Transplanted plants are to be planted and maintained in accordance with Section S611 Planting.

Pit at least twice size of root ball is to be dug, and plant set centered and plumb within pit. Burlap wrap and twine enclosing root ball is to be peeled back to expose top 1/2 of root ball, and all wraps and ropes removed. Prepared soil mix backfill material consisting of 2 parts native excavated material, 1 part saturated peat moss and 1 part topsoil is to be placed in 6 inch layers and thoroughly watered in to eliminate air pockets. Additional backfill material is to be placed and further watered in to compensate for any settlement. Backfill material is to be treated with slow release nitrogen thoroughly watered into backfill material.

S614-3.04 Removal

No cutting is to begin on any existing plant that is scheduled to be removed until approval has been received from Project Manager.

Trees are to be topped and limbed before felling.

Stumps are to be removed by grubbing, grinding or cutting. Stump holes are to be backfilled and compacted within 2 working days after removal of stump.

S614-4 METHOD OF MEASUREMENT

Quantity to be measured for payment will be number of existing plants pruned, transplanted or removed. Multiple plants growing out of same general excavation or pit will be measured as one plant.

Measurement for payment of removal of existing trees and stumps under this section, will only be for those existing trees and stumps that are 6 inches in diameter and larger. Payment for removal of existing trees and stumps that are less than 6 inches in diameter will be included under Item 203.02 Unclassified Excavation and Disposal.

Diameter of existing tree is to be measured before beginning work, with measurement being made 4 feet 6 inches above ground, commonly referred to as DBH (Diameter at Breast Height).

Measurement range for tree and stump removal will be as noted, with measurement being rounded to nearest inch. For example, 11.4 inch will be made as 11 inch, 11.5 inch will be made as 12 inch.

Separate payment for removal of existing stumps is limited only to existing stumps where tree was previously removed by others. Stumps that result from removal of respective existing tree by Contractor, will be paid for under appropriate tree removal item.

S614-5 BASIS OF PAYMENT

S614-5.01 General All Items

Unit price bid for all items includes cost of: removal and disposal of wood debris; protection of existing features; coordination with utilities; and furnishing all labor, material and equipment necessary to complete work.

S614-5.02 Prune Existing Plant

Unit price bid also includes cost of: cutting, removing and disposing undesirable growth and foreign materials; shaping plant crown; and repair of bark wounds.

S614-5.03 Transplant Existing Plant

Unit price bid also includes cost of: removing, balling, storing, trimming and re-planting existing plants; staking system; burlap; rope; prepared soil mix; hardwood mulch; water well; mulch retention pit; excavation and backfill.

S614-5.04 Remove Existing Shrub

Unit price bid also includes cost of: removing and disposing existing shrub and stump; excavation and backfill.

Removal of existing shrubs will be paid for under either NYSDOT Section 201 Clearing and Grubbing, Section R203 Excavation and Embankment, or Section S614 Care of Plants, as indicated in Contract Documents.

S614-5.05 Remove Existing Tree

Unit price bid also includes cost of: removing and disposing existing tree and stump; excavation and backfill.

S614-5.06 Remove Existing Stump

Unit price bid also includes cost of: grubbing, grinding, cutting and disposing existing stump; excavation and backfill.

Payment will be made under:

Note: XX in bid item number represents each individual size of tree to be transplanted. i.e.: 6" tree would be bid as S614.3306 Transplant Existing Tree – 6" DBH.

ITEM NO.	ITEM	PAY UNIT
S614.30	Prune Existing Shrub	Each
S614.31	Prune Existing Tree	Each
S614.32	Transplant Existing Shrub	Each
S614.33XX	Transplant Existing Tree - X" DBH	Each
S614.34	Remove Existing Shrub	Each
S614.35	Tree Removal - 6" to 11" DBH	Each
S614.36	Tree Removal - 12" to 17" DBH	Each
S614.37	Tree Removal - 18" to 23" DBH	Each
S614.38	Tree Removal - 24" to 29" DBH	Each
S614.39	Tree Removal - 30" to 35" DBH	Each
S614.40	Tree Removal - 36" to 41" DBH	Each
S614.41	Tree Removal - 42" to 47" DBH	Each
S614.42	Tree Removal - 48" and over DBH	Each
S614.43	Stump Removal - 6" to 11" Diameter	Each
S614.44	Stump Removal - 12" to 17" Diameter	Each
S614.45	Stump Removal - 18" to 23" Diameter	Each
S614.46	Stump Removal - 24" to 29" Diameter	Each
S614.47	Stump Removal - 30" to 35" Diameter	Each
S614.48	Stump Removal - 36" to 41" Diameter	Each
S614.49	Stump Removal - 42" to 47" Diameter	Each
S614.50	Stump Removal - 48" Diameter and Over	Each

REVISED March 3, 2015

SECTION 617 – INVASIVE REMOVAL

617 GENERAL

Purpose of this directive is to designate certain NYSDOT bid items for use on all City projects.

For this directive, requirements of NYSDOT Section 617 Tree Protection of *NYSDOT Standard Specifications (US Customary Units dated July 23, 2009)*, including any addenda, remains in effect.

* special specification

617-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
617.01020024	Controlling Invasive Plant Species by Pulling	LS SF
617.10000024	Disposal of Material Containing Invasive Plant Species	LS CY
617.11000024	Equipment Cleaning for Invasive Plant Species	LS LS

* Spec Created by LAF

[redacted]

REVISED August 31, 2015 ??

SECTION S617 - TREE PROTECTION

S617 GENERAL

It is responsibility of Contractor to provide tree protection fencing for all existing trees and tree root systems that are located within and immediately adjacent to Project limits to minimize any possible damage due to construction activities.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

S617-1 DESCRIPTION

Work consists of protection and care of existing trees as required in Contract Documents and as directed by Project Manager.

S617-2 MATERIALS

Tree protection fence material may be either fluorescent orange construction safety fencing, or wood rail and post. Tree protection fence is to be at least 4 feet high.

Water is to be in accordance with NYSDOT Section 712-01 Water.

S617-3 CONSTRUCTION DETAILS

S617-3.01 General

Tree protection is to be provided to protect all existing trees within and immediately adjacent to project limits against any accidental cutting, breaking, skinning, or bruising of tree roots, tree bark and tree branches due to Contractor's operations. Tree protection fencing is to be installed before any construction activities commence, and is to remain in place until Contractor is ready to perform final grading and seeding operations. Before commencing any work within any established tree protection zone, Contractor is to receive written authorization from representative of City Forester's office.

Contractor is not to place or stockpile any construction or excavated materials within limits of canopy of any existing tree to prevent smothering of existing tree's root system. Vehicles and other construction equipment are not to be parked on any tree root system, nor left running (idling) under limits of canopy of any existing tree.

Cutting of existing sod and topsoil materials within 4 feet of existing tree trunk for removal to establish new finished grade must be done manually.

Existing tree root system must remain adequate for existing tree to withstand heavy windstorms. If any existing tree roots that are 2 inches in diameter or larger are in conflict with any proposed work and need to be cut, before cutting those tree roots Contractor must notify City Forestry section by calling (585) 428-7581 to arrange for inspection of existing tree root system.

S617-3.02 Fencing

Existing tree is to be fenced in such manner that tree protection fencing encompasses entire limit of canopy of existing tree. In no case is tree protection fencing to be less than 2 feet from outer edge of existing tree trunk. In those areas where existing tree is bordered by paved surface, curb, wall or building, and minimum tree protection fence dimensions cannot be achieved, tree protection fence is to be installed to within 12 inches of nearest edge of such paved surface, curb, wall or building.

Tree protection fencing is to be installed around existing tree according to following extents:

Tree Diameter (DBH) (inches)	Minimum Distance of Fence from Tree Trunk – each side (feet)
less than 10	6
10 thru 14	10
15 thru 19	12
20 and over	15

S617-3.03 Maintenance

Tree protection fencing is to be maintained in good condition, and in an upright position. Tree protection fencing that has been damaged, collapsed or been knocked down, or otherwise damaged, is to be restored within 24 hours.

Where cutting of existing tree roots is necessary, it is to be done with sharp cutting tools. Exposed tree roots are to be re-buried as soon as possible. Until exposed tree roots can be re-buried, exposed tree roots are to be covered with wet burlap. Burlap is to be kept wet until exposed tree roots can be re-buried.

Where extensive cutting of existing tree root system has occurred, existing tree root system is to be watered to extent of limits of canopy of existing tree. Apply minimum 1/2 inch of water within 72 hours of when extensive cutting of existing tree root system has occurred.

When weather conditions are consistently dry and when less than 1/2 inch of rain has fallen during any given week, water existing tree root system to extent of limits of canopy of existing tree with at least 1 inch of water.

Existing trees that are damaged by construction activities are to be repaired within 72 hours using current arboricultural standards. Those existing trees that are determined by City Forester to be damaged beyond repair, are to be removed and replaced by Contractor.

S617-3.04 Utility Installation

Where underground installation of new utility is required to be done within outer limits of canopy of existing tree, tunneling operation is to be used for installation of new utility. Tunneling within outer limits of canopy of existing tree is to be done according to following:

Tree Diameter (DBH) (inches)	Distance of Tunnel From Tree Trunk – each side (feet)	Minimum Recommended Depth (feet)
less than 10	6	2-1/2
10 thru 14	10	3
15 thru 19	12	3-1/2
20 and over	15	4

S617-4 METHOD OF MEASUREMENT

Quantity to be measured for payment will be number of linear feet of tree protection fence installed, as measured along top of tree protection fence, center to center of end posts.

S617-5 BASIS OF PAYMENT

Unit price bid includes cost of: furnishing, installing, maintaining and removing tree protection fence; hardware; watering; cutting, maintenance and repair of damaged tree roots; burlap; repair or replacement of damaged existing trees; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S617.01	Fencing for Tree Protection	Linear Foot

REVISED March 3, 2015

SECTION S619 - MAINTENANCE AND PROTECTION OF TRAFFIC

S619 GENERAL

Work is to be in accordance with Section R619 Maintenance and Protection of Traffic and NYSDOT Section 619 Maintenance and Protection of Traffic, with following modifications:

S619-1 DESCRIPTION

Under Section R619-1 Description on page S-111, **ADD** following:

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

After Section R619-3 Construction Details on page S-111, **ADD** following:

S619-4 METHOD OF MEASUREMENT

S619-4.14 Maintenance and Protection of Traffic

Quantity to be measured for payment will be on lump sum basis for each individual street specified.

If both Items R619.01 Basic Maintenance and Protection of Traffic and S619.01XX Maintenance and Protection of Traffic – Street Name specific appear in Contract Documents, lump sum basis for Item S619.01XX will be for work on that specified street only, while lump sum basis for Item R619.01 will be for work on all other streets included in Contract Documents.

S619-5 BASIS OF PAYMENT

Under Section R619-5 Basis of Payment on page S-111, **ADD** following:

Payment will be made under:

Note: XX in bid item number represents maintenance and protection of traffic work required for each individual street as identified in item description. i.e.: S619.0101 Maintenance and Protection of Traffic – Loudisa Drive.

ITEM NO.	ITEM	PAY UNIT
S619.01XX	Maintenance and Protection of Traffic - Street Name	Lump Sum

REVISED March 3, 2015

SECTION 620 – BANK AND CHANNEL PROTECTION

620 GENERAL

Purpose of this directive is to designate certain NYSDOT bid items for use on all City projects.

For this directive, requirements of NYSDOT Section 620 Bank and Channel Protection of *NYSDOT Standard Specifications (US Customary Units dated May 4, 2008)*, including any addenda, remains in effect.

620-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
620.04	Stone Filling (Medium)	CY

REVISED August 31, 2015

SECTION 623 – CRUSHED STONE STABILIZATION COURSE

623 GENERAL

Purpose of this directive is to designate certain NYSDOT bid items for use on all City projects.

For this directive, requirements of NYSDOT Section 623 Crushed Stone Stabilization Course of *NYSDOT Standard Specifications (US Customary Units dated May 22, 2013)*, including any addenda, remains in effect.

623-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
623.1201000	Crushed Stone Stabilization Course for Porous Pavement	CY
623.1202000	Crushed Stone Resevoir Course for Porous Pavement	CY
623.13	Crushed Stone (In Place Measure)	CY

REVISED August 31, 2015

SECTION S626 – MONUMENT FOR BURIAL GRID MARKER

S626-1 DESCRIPTION

Work consists of installation of monument for burial grid marker as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with the following: American Society for Testing and Materials (ASTM).

For each item specified in description of work, provide information showing complete detail, location in the project, material and size of components.

Monuments shall be set under the direction of a Land Surveyor licensed to practice in the State of New York.

S626-2 MATERIALS

S626-2.01 General

Gravesite grid monuments shall be comprised of an aluminum survey marker (monument marker) set into a pre-cast concrete base field set in concrete.

S626-2.02 – Concrete Monument Base

Concrete foundation to conform to S504 – Portland Cement Concrete – Class K. Provide 3,500 PSI concrete at 28 days to dimensions indicated on the Contract Documents.

S626-2.03 – Monument Marker

Monument Marker shall be: Domed-top, 3 1/2" diameter, forged aluminum concrete survey marker with integral locator magnet, and flared anchor post for securing to concrete.

Text and Cross-hairs: Text of top as shown on Contract Drawings; text all caps with height to be 3/16". Cross hairs shall be field engraved as shown on the Contract Drawings, aligned with the gravesite grid and engraved based upon Contractor-surveyed location data.

S626-3 CONSTRUCTION DETAILS

S626-3.01 General

All material must be checked upon receipt at the job site prior to installation to check for any damage that may have occurred during transport. Units will be installed in complete accordance with manufacturers' recommendations and as shown the Contract Drawings.

Cross-hairs on aluminum monument markers shall be field inscribed, based upon accurate Contractor-survey: refer to Contract Drawings.

S626-4 METHOD OF PAYMENT

S626-4.01 Item

Quantity to be measured for payment will be number of units installed..

S626-5 BASIS OF PAYMENT

S626-5.01 General

Unitprice bid includes cost of furnishing and construction of monument for burial grid markers including all excavation, furnishing and installing concrete and marker components necessary to complete work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S626.11	Monument for Burial Grid Marker	Each

CREATED September 10, 2015

SECTION S637 – FIELD OFFICE

S637-1 DESCRIPTION

Work consists of furnishing and installing field office as required in Contract Documents and as directed by Project Manager.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

S637-2 MATERIALS

S637-2.01 General

Field office is to be for sole use of resident engineer, and is to be separate from any other building used by Contractor. Field office is to be within weatherproof building or mobile trailer that is habitable, in good condition, free of any health or safety hazards, readily accessible to public, and located within reasonable short distance of project site. Field office is to be in compliance with New York State Uniform Fire Prevention and Building Code, 19 NYCRR, and all applicable local building, safety and health regulations and laws. If requested, Project Manager is to be provided with copy of Certificate of Occupancy for field office.

Signage is to be placed so as to readily identify and locate field office. Field office sign is to be conspicuously placed or mounted on field office. If necessary, other signage is to be posted that will be capable of directing public to location of field office. Freestanding sign supports are to be breakaway type.

Field office sign board is to be 3 feet by 4 feet, constructed from 3/4 inch thick duraply or A-A exterior grade plywood, painted with two coats of white exterior enamel paint. Lettering is to be done with one color, pms 287C blue, and is to be done by either silk screen process, die cut vinyl letters (permanent adhesive), hand lettering, or stencil.

Field office sign is to have following information denoted, all in capital letters, centered horizontally on sign board:

- FIELD OFFICE
- NAME OF PROJECT
- CONTRACTOR'S NAME
- CITY AND RESIDENT ENGINEER CONTACT PHONE NUMBERS

FIELD OFFICE and NAME OF PROJECT are to be swiss 721 condensed bold 3 inch letters 1.50 inch line spacing.

CONTRACTOR'S NAME and CITY AND RESIDENT ENGINEER CONTACT PHONE NUMBERS are to be swiss 721 condensed bold 1 inch letters 0.75 inch line spacing.

Paved or other hard surfaced (crushed stone or gravel material) parking area is to be located immediately adjacent to field office. Each parking space is to be at least 9 feet wide by 18 feet deep, with minimum of two parking spaces provided immediately adjacent to field office.

S637-2.02 Field Office – General Requirements

Field office is to have minimum ceiling height of 7 feet. Doors and windows are to be weatherproofed, and each equipped with adequate and operational locking devices. Windows are to be minimum of 8 square feet, screened, and capable of being opened and closed to provide adequate ventilation.

Restroom is to be separately enclosed room, lockable from inside, properly ventilated and in compliance with applicable sanitary codes. Restroom is to be provided with operational flush-type toilet, all lavatory amenities, necessary paper and soap products, and hot and cold running water.

Potable water from local municipal water supply, or bottled with heating/refrigerator unit to provide hot and cold water.

Electrical system capable of providing continuous service to operate all equipment and have adequate amount of receptacles. Dedicated 20 amp electrical service is to be provided for operation of computer equipment.

Electric light is to be provided by non-glare type luminaries capable of providing minimum illumination level of 100 foot candles at desk-height level.

Fire extinguishers, smoke and carbon monoxide detectors are to be located in each room and are to be fully operational and properly installed.

Heating and cooling equipment that is operational and capable of maintaining constant ambient air temperature of 70°F, ±5°F.

S637-2.03 Field Office – Equipment and Furnishing

Computer Connection. Dedicated telephone line or high speed internet connection for computer access. Provide separate jack for internet connection in each room. Computer will be supplied by resident engineer.

Digital Camera. Digital camera complete with all necessary hardware, cables, operating manuals, and other pertinent media required for operation of digital camera unit itself, including connecting digital camera to office computer system. Digital camera must be able to download images to computer without any proprietary software having to be installed on computer.

Facsimile (Fax) Machine. Plain paper laser or inkjet fax machine with dedicated telephone line. Fax machine is to be capable of sending and printing maximum paper size of 8-1/2 inches x 14 inches, with minimum 20 page memory storage, 20-sheet document feeder, and 50-sheet paper capacity. Fax machine is to be able to transmit at least 6 pages per minute and have an autodial/redial with minimum of 50 phone number memory capability. Fax machine is to be capable of storing and printing outgoing message confirmation information and printing sender's name, fax number and page number on incoming faxes.

First Aid Kit. Type III first aid kit in accordance with ANSI Z308.1 Minimum Requirements for Workplace First Aid Kits. First aid kit is to be kept properly stocked at all times.

Paper Supplies. Provide total of three packages of multi-purpose white paper (500 sheets, 20 pound, 92 brightness) as initial stock. Provide one package for each paper size required (8-1/2 inches x 11 inches, 8-1/2 inches x 14 inches, and 11 inches x 17 inches).

Photocopy Machine. Heavy duty electric dry-process type photocopy machine, capable of copying paper sizes 8-1/2 inches x 11 inches, 8-1/2 inches x 14 inches, and 11 inches x 17 inches.

Stove. Electric, propane or bottle gas type stove with minimum of two burners adequate for rapid drying of soil samples, including adequate supply of fuel or electrical supply. Stove is required only when Excavation and Embankment or Culverts and Storm Drains are included in project, and separate field laboratory is not included.

Telephone with Answering Machine. Telephone with answering machine capable of recording outgoing message up to 60 seconds in duration, and receiving minimum of 40 incoming messages of 60 seconds in duration. Answering machine must include automated voice marking of time and day of each message received, and provide message mark so that new messages may be played back without erasing old messages. Answering machine is to include remote programming of playback, backspace, and outgoing message re-record and allow for retrieval of messages without remote control unit. Provide extension telephone for each separate room.

Telephone Lines. Separate telephone lines are to be provided for telephone, fax machine and high speed internet connection for computer access. Provide separate jack for telephone and internet connection in each room.

Thermometer. Minimum-maximum thermometer displaying in degrees fahrenheit and mounted with an external probe to give both indoors and outdoors temperature.

Coat Rack. Metal or wood coat rack or closet capable of holding at least 4 coats.

Drafting Stool. Fully assembled adjustable height type drafting stool with backrest.

Drafting Table. Fully assembled adjustable height tilting top drafting table with brackets and legs and approximate dimensions of 3 feet x 6 feet.

Filing Cabinet. Fire resistant, legal size 2-drawer or 4-drawer filing cabinet with locks and two keys each, meeting requirements of ANSI/UL Standard 72 for Insulated Filing Devices, Class 350-1 hour.

Office Chair. Fully assembled adjustable type office chair with arms and 5 legs with casters, 2 office chairs per office desk.

Office Desk. Fully assembled and freestanding office desk, minimum of 5 feet long, 2-1/2 feet wide, 2-1/2 feet high, with at least 2 lockable drawers.

Pencil Sharpener. Manual or electric pencil sharpener, minimum one per room.

Plan Filing Rack. Vertical plan filing rack constructed of metal, capable of hanging up to four sets of plan drawings up to 24 inches x 36 inches in size, with four hanging clamps included.

Role File Unit. Eight compartment role file unit. Each compartment is to be approximately 6 inches x 6 inches capable of housing rolls of cross-sections that are minimum of 22 inches long.

Storage Locker. Metal or wood storage locker with shelve(s), tumbler lock and two keys for storage of survey, GPS and testing equipment. Total locker space footprint is to be minimum of 2-1/2 square feet, and is to be minimum 6 feet high.

Table. Commercial-grade rectangular table with weather/spill resistant top, minimum size of 6 feet long, 2-1/2 feet wide, and 2-1/2 feet high.

Wastebasket. Wastebasket with minimum capacity of 6 gallons. Provide one wastebasket for each desk and table.

S637-2.04 Field Office – Type A and Type B

Field office Type A is to have minimum of 160 square feet of floor space with one outside door and at least four windows.

Field office Type B is to have minimum of 330 square feet of floor space with two outside doors and at least six windows. Field office is to be partitioned to provide minimum of two rooms with an adjoining door. Smaller room is not to be less than 96 square feet in floor area and is to contain two windows.

S637-2.06 Field Office - Minimum Requirements

Field Office		
Item Description	**Type A**	**Type B**
Parking spaces	2	3
Area floor space	160 square feet	330 square feet
Number of rooms (not counting restroom)	1	2
Restroom	1	1
Doors – outside	1	2
Windows	4	6

Field Office Equipment		
Item Description	**Type A**	**Type B**
Fire extinguisher	1	2
Smoke detector	1	2
Carbon monoxide detector	1	2
Computer connection	1	2
Digital camera	1	1
Facsimile (Fax) machine	1	1
First aid kit	1	1
Paper supplies	3 reams (1 each paper size)	3 reams (1 each paper size)
Photocopy machine	1	1
Telephone w/answering machine	1	1
Telephone w/o answering machine	-	1
Telephone lines	3	3 (5 connections)
Thermometer	1	1
Coat rack	1	1
Drafting stool	1	2
Drafting table	1	2
Filing cabinet	(1) 2 drawer	(1) 4 drawer
Office chair	2	4
Office desk	1	2
Pencil sharpener	1	2
Plan filing rack	1	1
Role file unit	1	1
Storage locker	1	1
Stove (if required)	1	1
Table	1	1
Wastebasket	3	5

S637-3 CONSTRUCTION DETAILS

Field office is to be fully equipped and made available for use and occupancy by City's project representative prior to start of any other work on project. Such use and occupancy is to be made available until City relinquishes its use.

City will retain ownership of any data storage media, data storage containers and consumables.

Contractor is responsible to maintain field office complete with furniture and equipment in safe and operable condition, and have adequate stock of supplies and materials on hand at all times. Equipment provided with field office is to be fully operational prior to resident engineer occupying field office. Contractor is to provide instruction to project engineer regarding proper use and operation of equipment provided with field office.

Furniture and equipment is to be fully assembled, operational and clean. Field office is to be cleaned and rubbish removed as necessary, but not less than at least once per week. Field office is to be kept free of pests, both human and otherwise.

Areas subject to pedestrian access, and vehicular circulation and parking, are to be maintained and kept clear of debris and accumulation of any weather related materials such as leaves and snow.

Contractor is responsible, until use and occupancy of field office is relinquished by City, for any damage, direct or indirect, of whatever nature, occurring to property of City and property of resident engineer which is kept in field office. Such property will be limited to only those items used by resident engineer in performance of project related work activities. Such property is to be replaced within 30 days of reported damages and includes any loss caused by, but not limited to, fire, theft, vandalism or malicious mischief.

Resident engineer is to provide Contractor with detailed list of project related items, with corresponding dollar values, belonging to City and resident engineer which are kept in field office. Resident engineer is to provide Contractor with updates when something on list changes. Contractor will not be responsible for any items kept in field office that are not on this list, or are not project related.

After completion of project, field office is to be disassembled. If mobile trailer was used as field office, it is to be removed from location, and area cleaned and restored to original or better condition within 30 days of removal of mobile trailer.

S637-4 METHOD OF MEASUREMENT

Quantity to be measured for payment will be number of months to nearest quarter (0.25) of month for which field office has been properly provided.

Measurement will not commence any sooner than date of start work order is effective, and will cease when City relinquishes its use.

S637-5 BASIS OF PAYMENT

Unit price bid includes cost of: providing and furnishing field office complete with all required fixtures, equipment, paper supplies, furniture, parking; signage; maintenance and repair of fixtures, equipment, furniture; weekly cleaning and upkeep; repair or replacement of City and resident engineer project related property that is damaged or lost due to fire, theft, vandalism or malicious mischief; removal mobile trailer and site restoration; and furnishing all labor, material and equipment necessary to complete work.

Payment will be made for each month of availability for occupancy by resident engineer.

No payment will be made under Field Office for each calendar day during which there are deficiencies in compliance with these requirements. First calendar day commences 24 hours after written notice has been delivered to Contractor of such deficiency. Amount of such calendar day nonpayment will be determined by dividing unit price bid per month by 30.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S637.10	Field Office - Type A	Month
S637.11	Field Office - Type B	Month

REVISED March 3, 2015

SECTION 647 – RELOCATING SIGN SIZE A

647 GENERAL

Purpose of this directive is to designate certain NYSDOT bid items for use on all City projects.

For this directive, requirements of NYSDOT Section 647 Relocating Sign Size A of *NYSDOT Standard Specifications (US Customary Units dated September 6, 2012)*, including any addenda, remains in effect.

647-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
647.11	Relocating Sign Size A	EA

REVISED August 31, 2015

SECTION S900 - GENERAL WATER PROVISIONS

S900 GENERAL

These general water provisions apply to all specifications for work on water system, and by reference is part of each section of those specifications.

S900-2 MATERIALS

Materials and product manufacturer shall be in accordance with the current City of Rochester Water Bureau's Approved Products List or approved equivalent.

S900-2.01 Hardware

Hardware is to be made of blue fluorocarbon coated, cold formed, high strength, low-alloy steel in accordance with ANSI/AWWA C111/A21.11.

S900-2.02 Warning Tape

Warning tape is to be 3-inch wide blue colored direct burial detectable metallic-lamination tape designed to locate and warn excavators of existing buried water pipes. Warning tape is to be marked in bold readable lettering **"CAUTION WATER LINE BURIED BELOW"**.

S900-2.03 Material Certification

Manufacturers and suppliers certifications are to be furnished to Project Manager stating that materials furnished have passed acceptance tests listed in appropriate specification.

Water pipe, fittings and appurtenances that come into contact with drinking water are to be certified by an ANSI approved third-party North American certification program or laboratory for conformance with American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61 for health effects and also ANSI/NSF Standard 61-Annex G or ANSI/NSF Standard 372 for "lead free" lead content requirements.

S900-2.04 Thrust Restraint

Concrete for thrust blocks is to be Class K in conformance with requirements of Section S504 Portland Cement Concrete, and can be either central, transit or truck mixed. With prior approval of Project Manager, an on-site mixed concrete can be used in lieu of Class K mix. Use of dry unmixed cement for constructing thrust blocks is prohibited.

Push-on joints and mechanical joints may require restraint by utilizing restraining devices as described in the Materials Section of S901, Water Main Pipe and Fittings. Restraining device is to be installed according to manufacturer's instructions. See Standard Detail for length of water pipe, including all pipe joints within the given length, required to be restrained.

Tie rods and clamps may be used in lieu of restraining device and are subject to approval of Project Manager prior to their use in water work. Tie rods, clamps and hardware are to be in conformance with requirements of Section S900-2.01.

Number and diameter of tie rods to be used for restrained joints shall be as shown in the following table:

NUMBER OF TIE RODS REQUIRED FOR JOINT RESTRAINT						
Water Pipe Size (inches)	Domestic System Rod Diameter			Holly System Rod Diameter		
	5/8 inch	3/4 inch	1 inch	5/8 inch	3/4 inch	1 inch
4	2	-	-	2	-	-
6	-	2	-	-	2	-
8	-	2	-	-	2	-
10	-	2	-	-	2	-
12	-	2	-	-	4	-
16	-	4	2	-	4	2
20	-	4	2	-	6	4

Prior to backfilling, uncoated tie rods, clamps and any components made of metal used for restrained joints are to receive hand brushed application of an approved bitumastic coating specifically manufactured for underground use or wax tape coating system.

S900-2.05 Bedding and Backfill Materials

Sand material is to be used for embedment around water pipe and fittings and is to be in conformance with requirements of Section S203 Excavation and Embankment. Use of select granular backfill (water), locally excavated or pulverized concrete materials for purpose of embedment around water pipe and fittings is prohibited. Only an approved sand material is to be used for purpose of embedding water pipe and fittings.

Select granular backfill (water) material to be used as backfill above sand embedment course is to be in conformance with requirements of Section S203 Excavation and Embankment.

In lieu of select granular backfill (water) material, locally excavated or pulverized concrete material that is determined suitable for use by Project Manager can be used as backfill above sand embedment course.

Suitable locally excavated material consists of hard durable materials and soil that is free of clay, frozen, organic and other extraneous materials, and stones that are dimensionally greater than 3 inch in diameter.

Suitable pulverized concrete material is not to be dimensionally greater than 3 inch in diameter.

S900-2.06 Controlled Density Fill Material

Controlled density fill material is to have a compressive strength of 50 to 100 pounds per square inch, and must not contain fly ash or other pozzolan containing materials.

S900-2.07 Surface Restoration Materials

Following materials are to be used:

- Subbase material Type 1 and Type 2 in conformance with requirements of NYSDOT Section 304 Subbase Course
- Hot Mix Asphalt 37.5 F9 Base Course HMA, 19 F9 Binder Course HMA and 9.5 F2 Top Course HMA, 80 Series Compaction, in conformance with requirements of NYSDOT Section 402 Hot Mix Asphalt (HMA) Pavements
- Concrete foundation for pavement, Class C or Class F, in conformance with requirements of NYSDOT Section 503 Portland Cement Concrete Foundation for Pavement
- Concrete and asphalt concrete sidewalk and driveway in conformance with requirements of Section S608 Sidewalk and Driveway

- Curb in conformance with requirements of Section S609 Curb
- Seeding in conformance with requirements of Section S610 Landscape
- Topsoil in conformance with requirements of Section S613 Topsoil
- Concrete gutter in conformance with requirements of Section R624 Concrete Gutter

S900-3 CONSTRUCTION DETAILS

S900-3.01 General

Work on water system is to be coordinated with Bureau of Water. Location and disposition of water services must be verified before beginning any water system related work.

Where existing water system is required to be shut down as approved by the Project Manager, Bureau of Water will close existing water valves needed to isolate that section of existing water system. Bureau of Water is to be notified minimum of 10 working days in advance of intent to do work that requires section of existing water system to be shut down, and again minimum of 2 working days in advance of when actual work is to begin. Water valves and hydrants are to be operated only by authorized Bureau of Water personnel.

Work is to be scheduled so as to maintain adequate level of water service, with interruptions being of minimum duration. Affected water service customer is to be notified by Contractor minimum of 24 hours in advance of any planned water service disruption. Temporary water service is to be provided to water service customer where water service is to be discontinued for more than 8 hours, or when indicated in Contract Documents. Method of providing temporary water service is to be in conformance with requirements of Section S916 Temporary Bypass.

Businesses and sensitive water service customers that require continuous water service for their basic operation are to receive a written notification by Contractor minimum of 72 hours in advance of planned water service disruption and be provided with temporary water supply when water system is shut down, or water shut shall be coordinated such that it occurs outside normal business operating hours.

Permit is required from Bureau of Water to use water from hydrants. Permit requires use of water meter and backflow preventer being supplied by Bureau of Water.

Bureau of Water dispatcher and Project Manager must be immediately notified when existing hydrant is put out of service. Dispatcher will inform Fire Department of out of service hydrant, and Contractor is to red tag out of service hydrant. Dispatcher must be notified when hydrant is placed back in service.

Contractor is to provide record information of all water service work to Bureau of Water Engineering Section. Record information is to be submitted in form of water service card. Blank water service card can be obtained from Bureau of Water Materials and Equipment Section. Water service card is to be submitted for approval to Bureau of Water Engineering Section with all required information completely filled in. Record information to be provided on each water service card includes street address, coordinate location of water service pipe and curb stop, sizes and type of material installed, and Contractor's and inspector's names.

Excavation is to be in conformance with requirements of Section R206 Trench and Culvert Excavation. Excavation for new water construction is to be only to sufficient length, width and depth needed to perform work in safe manner, to expose existing water pipe, and for proper installation of new water pipe and fittings.

Appropriate measures are to be taken to prevent extraneous material and ground water from contaminating water system. Ground water level is never to be less than 12 inches below invert of water pipe. To prevent contamination, open ends of water pipe that are left unattended are to be plugged with watertight plug, and wrapped in a double layer of polyethylene plastic and tightly taped or tied.

Prior to installation, water valves and hydrants are to be inspected, cleaned, lubricated and tested to insure they are in proper working order and bolts and nuts are torqued to manufacturer's specifications.

Prior to installation of any new water pipe and fittings, open end of existing water pipe is to be cleaned, removing all external dirt, scale and rust for minimum distance of 12 inches beyond end of new water pipe and fittings. Extraneous material that ends up inside water pipe must be removed via scouring by manipulating respective water valve.

Trenches located within existing pavement areas are to be surface finished with temporary pavement before end of work day. Temporary pavement is to be in conformance with requirements of Section S412 Temporary Pavement.

Extra caution is to be taken when working in vicinity of existing water pipe which is to remain in service. No vibratory equipment is to be used within 5 feet horizontally of existing cast iron, steel, asbestos cement and prestressed concrete cylinder water pipe.

Cut and open water pipe ends on abandoned water main and hydrant branch pipes are to be plugged with concrete. Concrete plug is to completely fill and seal end of abandoned water pipe to minimum depth of 12 inches. Abandoned water valves and curb stops are to be permanently closed and are to be left in shut position.

New water service taps may be installed during installation of water pipe as approved by the Project Manager.

S900-3.02 installation

Water pipe and fittings are to be installed to required alignment and depth as required in Contract Documents and as approved by Project Manager. Alignment and depth of water pipe and fittings specified in Contract Documents is approximate only. Actual alignment and depth may be adjusted to meet field conditions at time of installation as approved by Project Engineer. Control points are to be carefully preserved.

Full depth pavement saw cutting is required for trenching in pavement areas that are located outside of full pavement reconstruction. All pavement saw cutting is to be done prior to commencing any water work, and is to be done in conformance with requirements of Section R622 Saw Cutting.

Excavation limits for installation of water pipe and fittings are to be to required alignment and depth to provide for minimum cover over water pipe and fittings, as measured between finished grade and top of water pipe and fittings shall be (unless noted otherwise on plans):

- 4 feet 6 inches for domestic water pipe
- 5 feet for Holly system water pipe

Trench is to be de-watered, and kept free of water at all times.

Where trench bottom is determined to be unstable by Project Manager, unsuitable material is to be removed to width and depth as approved by Project Manager, and excavated area shall be backfilled with select granular backfill or subbase course material.

Rock that is encountered within bounds of required excavation, embedment and backfill limits, is to be removed.

Before installation interior of water pipe and fittings that cannot be normally disinfected shall be swabbed with 1- 5 percent minimum hypochlorite solution.

Where it is required to cut or remove section of existing water pipe, cut is to be made straight, smooth and perpendicular to centerline of existing water pipe. Prior to cutting of water pipe, pipe cutting equipment and methods are to be as approved by Project Manager.

S900-3.03 Bedding and Backfill

Water pipe and fittings are to be completely embedded within sand material, as measured from exterior limit of water pipe and fitting to minimum extent of:

- 12 inches on each side
- 6 inches below bottom
- 12 inches above top

Sand embedment material is to be installed and compacted in conformance with requirements of Section S203 Excavation and Embankment. Sand bedding is to provide solid bearing through entire length of water pipe and fittings. Timber blocking is not to be used without prior approval of Project Manager, and is to be removed prior to backfilling of trench.

Warning tape is to be placed in open trench 12 inches above water pipe that is 4 inch and larger. Warning tape is to run continuously above and along centerline of water pipe, with wording facing up.

Backfill under paved areas is to be select granular backfill (water), and is to be installed and compacted in conformance with requirements of Section S203 Excavation and Embankment, with following modifications:

- Lift thickness is not to exceed 12 inches
- Minimum density for all backfill materials is to be 95 percent of Standard Proctor Maximum Density

S900-3.04 Filling and Flushing

Water pipe is to be slowly filled with water of potable quality at maximum velocity of 1 foot per second while all air is expelled from water pipe. Precautions are to be taken to prevent entrapping air in water pipe. After filling, water pipe is to be flushed at blow-offs and dead-ends at minimum velocity of 3 feet per second. Minimum of three changes of potable water are to be used in flushing operation.

S900-3.05 Testing

A. General

A hydrostatic pressure test is to be conducted on the water main after all required pipe and fittings have been installed including hydrant branches up to the hydrant and water services four (4) inches in diameter and larger. The length of water pipe to be pressure tested will be as approved by the Project Manager. The test shall be conducted using equipment that is capable of accurately measuring the pressure within the pipe and the amount of water added to the pipe during the test. The pressure test is to be witnessed by the Project Manager.

The section of water pipe to be pressure tested shall be filled with water of potable quality and all air expelled. Temporary taps on the water pipe are to be made at high points and other locations along the pipe, as needed, to release air from the pipe or for other testing purposes. All temporary taps shall be permanently plugged after successful completion of the hydrostatic test.

The Contractor shall notify the Project Manager 24 hours in advance of beginning the hydrostatic pressure test. The Contractor shall furnish the pressure testing apparatus. The apparatus shall include a water pressure gauge and water meter that have been properly calibrated for the work. Calibration testing of the gauge and meter shall be performed by an ISO 17025-accredited laboratory. The pressure gauge shall have a maximum range of 0 to 300 pounds per square inch (p.s.i.), a 3-1/2 inch minimum diameter dial with a graduation of 2 p.s.i. or smaller, and a gauge accuracy of at least 0.50 per cent.

The testing apparatus shall be equipped with a second port being a 1/4 inch NPT female quick-connect fitting to accommodate a second pressure gauge by the Water Bureau when ordered by the Project Manager. The ports shall be plumbed so that the gauges are installed in the upright position. The allowable difference between the Contractor's pressure gauge and the Bureau's pressure gauge shall not exceed 10 p.s.i. at the specified test pressure.

B. General - Ductile Iron, Polyvinyl Chloride (PVC), Molecularly Oriented Polyvinyl Chloride (PVCO) Water Pipe

For the hydrostatic pressure test, water pressure is to be raised (based on elevation at lowest point of water pipe under test and corrected to gauge location) to minimum pressure of:

- 150 pounds per square inch gauge for domestic water main
- 250 pounds per square inch gauge for Holly water main

After all visible leaks have been stopped, full test-pressure is to be maintained for minimum of 1 continuous hour with zero (0) gallons allowable leakage for each section of water pipe being tested.

If section of water pipe should fail to pass pressure test, defective section of water pipe is to be uncovered and repaired. Continually repeat pressure test, making repairs as necessary, until entire length of water pipe passes required pressure test.

C. High Density Polyethylene Water Pipe

Pressure test is to be done in accordance with requirements of ASTM F 2164.

For initial expansion phase of pressure test, water pressure is to be raised gradually to minimum test pressure of 240 pounds per square inch (based on elevation at lowest point of water pipe in pressure test and corrected to gauge location) and maintain pressure for up to 4 hours. The test pressure shall not exceed that of lowest pressure rated component. Additional make-up water will be required to be added to maintain test pressure at hourly intervals for initial expansion phase.

Following initial expansion phase, actual test phase begins. For actual test, minimum test pressure shall be reduced 10 psi and monitored continuously for period of 1 hour without additional make-up water. There shall be no visible leakage and pressure loss during test phase shall not be more than 5 per cent different from test phase pressure for section of water pipe being tested.

Under no circumstances should total time water pipe is under continuous test pressure exceed 8 hours. If pressure test is not completed due to leakage, equipment failure or for any other reason within 8 hour time period, water pipe test section should be permitted to "relax" for continuous 8 hour period prior to performing any further pressure testing.

S900-3.06 Disinfection

Disinfection of water main/temporary bypass pipe is to be done in accordance with latest requirements of ANSI/AWWA C651. Disinfection is required for domestic and Holly water system mains.

After section of water main/temporary bypass pipe has been successfully pressure tested, section of water main/temporary bypass pipe shall be thoroughly flushed. Method of flushing will be as approved by Project Manager. Minimum flushing velocity is to be 2.5 feet per second.

Flows to produce minimum velocity of 2.5 feet per second shall be as shown in the following table:

FLOWS TO PRODUCE MINIMUM VELOCITY OF 2.5 FEET PER SECOND		
Water Pipe Size (inches)	**Flow in Gallons per Minute (gpm)**	**Hydrant Openings at 40 Pounds per Square Inch (psi) Residual Pressure**
4	100	one 2-1/2 inches
6	200	one 2-1/2 inches
8	400	one 2-1/2 inches
10	600	one 2-1/2 inches
12	900	two 2-1/2 inches
16	1,600	two 2-1/2 inches
20	2,500	one 4-1/2 inches

See Table 3 AWWA C651 for number and size of blow-off taps, if blow-off taps are required.

Upon completion of flushing operations, water main/temporary bypass pipe is to be disinfected with chlorine solution using continuous feed method. Strength of chlorine solution is to be such that a residual of at least 25 milligrams per liter of chlorine is to be retained in water main/temporary bypass pipe after 24 hour period. For HDPE water pipe, chlorine solution is not to exceed 12 percent active chlorine due to chemical attack and degradation of polyethylene. Disinfection is to be in accordance with requirements of New York State Department of Health and of ANSI/AWWA C651, except that tablet method will not be allowed.

Water pipe, fittings, valves, exterior pipe surfaces on existing water main (such as for tapping sleeves, cutting-in valves, insertion sleeves, connections to existing water main and service saddles) in addition to tools and equipment that are to be in contact with encapsulated system water which will be installed without standard 24 hour disinfection detention period are to be spray disinfected or swabbed with minimum 1 to 5 per cent solution of chlorine no more than 30 minutes prior to installation. Following disinfection, water main/temporary bypass pipe is to be flushed until chlorine concentration in water leaving water main/temporary bypass pipe is no more than that generally prevailing in existing water system.

Samples of water will be collected from water main/temporary bypass pipe by Monroe County Department of Public Health. Monroe County Department of Public Health requires minimum of 2 working days advance notification requesting such sampling services. Contractor is to call (585) 753-5057 to arrange for sampling service.

Monroe County Department of Public Health may refuse to collect samples of water if location of disinfection/sampling tap is determined to be improper. Hydrants are not acceptable sampling points. Monroe County Department of Health will not perform sampling until it is in receipt of certification from New York State licensed or registered design professional certifying that water improvements, testing and disinfection were completed in accordance with approved plans, reports, specifications and any amendments. Such design professional may be either an engineer, architect, or land surveyor with special exemption under Section 7208(n) of Education Law.

Prior to collecting samples of water, sampling points must be decontaminated by flaming. Monroe County Department of Public Health will collect samples of water for free chlorine residual, total coliform, Escherichia coli (E. coli) and turbidity. Water main/temporary bypass pipe must not be placed in service until so authorized by Monroe County Department of Health.

REVISED February 13, 2014

SECTION S901 - WATER MAIN PIPE AND FITTINGS

S901-1 DESCRIPTION

Work consists of installation of water main pipe and fittings as required in Contract Documents and as directed by Project Manager.

Work is to be in conformance with requirements of Section S900 General Water Provisions.

S901-2 MATERIALS

S901-2.01 Ductile Iron Pipe and Fittings

Ductile iron pipe shall be Class 52 or Class 56, as indicated in Contract Documents, in conformance with requirements of ANSI/AWWA C151/A21.51

Fittings shall be ductile iron in conformance with requirements of ANSI/AWWA C110/A21.10 for full body fittings, and ANSI/AWWA C153/A21.53 for compact fittings. Fittings for ductile iron pipe that is 4 inches through 24 inches in diameter shall have rated working pressure of 350 pounds per square inch. Fittings for ductile iron pipe that is 30 inches through 48 inches in diameter shall have rated working pressure of 250 pounds per square inch.

Ductile iron pipe and fittings shall be of good quality, strength, of even grain, and soft enough to permit drilling and cutting. Each section of ductile iron pipe shall be free from any defects which would make it unfit for intended use. Ductile iron pipe shall be straight, and true circle in section with concentric inner and outer surfaces. Ductile iron pipe section to be cut during installation shall be fully gauged for field cutting. Ductile iron pipe metal shall be made without any admixture of cinder iron or other inferior material.

Interior of ductile iron pipe and fittings shall be cement mortar lined or epoxy coated. Cement mortar lined ductile iron pipe and fittings shall have interior lined with double thickness of cement mortar in conformance with requirements of ANSI/AWWA C104/A21.4, and have an asphalt coating on interior lining and exterior of pipe and fittings. Epoxy coated fittings shall have interior and exterior coated with 6 mil to 8 mil nominal thickness of fusion bonded epoxy in conformance with requirements of ANSI/AWWA C550 and C116/A21.16. Chips or breaks in the epoxy coating shall be repaired in the field by petrolatum wax tape coating system.

Joints shall be rubber gasketed Tyton Joint® push-on, mechanical joint, or mechanical joint anchoring type. Gaskets shall be made of SBR rubber. For ductile iron water main and fittings located within petroleum hydrocarbon and/or chlorinated solvent contaminated soils, gaskets shall be made of oil resistant Buna-N (Nitrile) rubber. When contaminated soil is encountered unexpectedly in the field, Contractor shall immediately notify Project Manager. All joints shall be in conformance with requirements of ANSI/AWWA C111/A21.11.

Joint restraint devices or anchor pipe shall be required in conjunction with concrete thrust blocking at points of change in direction of flow and at new hydrant branches. Restraining device is to be installed according to manufacturer's instructions. Restraining device is to have epoxy coating or approved equivalent. Hardware shall be coated with blue fluorocarbon coating, 304 stainless steel or approved equivalent.

Follower gland for mechanical joint ductile iron pipe shall be in conformance with requirements of ANSI/AWWA C151/A21.51.

S901-2.02 Polyethylene Tube Encasement for Ductile Iron Pipe

Polyethylene tube encasement for direct bury of ductile iron pipe 4 inches and larger in size shall consist of linear low-density polyethylene film 8 mil minimum thickness and polyethylene adhesive tape. Material and installation procedures shall be in conformance with requirements of ANSI/AWWA C105/A21.5.

S901-2.03 C900 Polyvinyl Chloride (PVC) Pipe and Fittings

PVC pipe shall be designation DR 14 pressure class 305 pipe in sizes 4 inch through 12 inch in diameter, blue in color, and in conformance with requirements of AWWA C900 Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch for Water Distribution.

PVC pipe and fittings shall be of good quality and strength and be homogenous throughout, with inside and outside surfaces being free of sticky or tacky material. PVC pipe and fittings shall be free of blisters, cracks, cuts, foreign inclusions, holes, nicks, significant scratches, voids, and other defects that may affect overall integrity of PVC pipe and fittings. PVC pipe or fittings having any indication of cracking or crazing inside or outside shall be rejected. PVC pipe shall be straight and true circle in section with concentric inner and outer surfaces. Joining surfaces of PVC pipe spigots and integral-bell and sleeve-reinforced bell sockets shall be free of imperfections that might cause leakage at joints. PVC pipe shall be manufactured to cast iron pipe equivalent outside diameters to allow direct connection into cast iron and ductile iron pipe and fittings.

Fittings for PVC pipe sizes 4 inches through 12 inches in diameter shall be PVC injection molded fittings in conformance with requirements ANSI/AWWA C907.

Joints shall be SBR rubber gasket push-on type. For PVC water main and fittings located within petroleum hydrocarbon and/or chlorinated solvent contaminated soils, gaskets shall be made of oil resistant Buna-N (Nitrile) rubber. When contaminated soil is encountered unexpectedly in the field, Contractor shall immediately notify Project Manager.

Mechanical joint restraint mechanism shall be required in conjunction with concrete thrust blocking at points of change in direction of flow and at new hydrant branches. Mechanical harness restraint shall be used for push-on joints.. Mechanical joint restraint mechanism shall have epoxy coating or approved equivalent. Hardware shall be coated with blue fluorocarbon coating, 304 stainless steel or approved equivalent. All mechanical joints on ductile iron fittings for PVC water main shall require mechanical restraint.

Ductile iron or cast iron fittings for all PVC pipe sizes will be allowed for connecting PVC water pipe to existing metallic water pipe And when PVC fittings are not readily available. Non-epoxy coated ductile and cast iron fittings on PVC water main are to be covered with protective wax tape coating.

S901-2.04 C906 High Density Polyethylene (HDPE) Pipe and Fittings

HDPE pipe and fittings shall be designation DR 9 pressure class 200 pipe in sizes 4 inches through 20 inches in diameter, color striped blue, and in conformance with requirements of AWWA C906 Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4 inch and larger for Water Distribution. HDPE pipe and fittings shall be made from resin meeting requirements of Plastic Pipe Institute (PPI) as PE3408. Resin material shall be in conformance with requirements of ASTM D3350 cell classification of 345464C.

HDPE pipe and fittings shall be of good quality and strength and be homogenous throughout, with inside and outside surfaces being semi-matte to glossy in appearance and free of sticky or tacky material. HDPE pipe and fittings shall be free of blisters, cracks, cuts, foreign inclusions, holes, nicks, significant scratches, voids, and other defects that may affect overall integrity of HDPE pipe and fittings. HDPE pipe or fittings having any indication of cracking or crazing inside or outside shall be rejected. HDPE pipe shall be straight and true circle in section with concentric inner and outer surfaces. Joining surfaces of HDPE pipe spigots and integral-bell and sleeve-reinforced bell sockets shall be free of imperfections that might cause leakage at joints. HDPE pipe shall be manufactured to cast iron pipe equivalent outside diameters to allow direct connection into cast iron and ductile iron pipe and fittings when necessary.

Fittings for HDPE pipe sizes 4 inches through 8 inches in diameter shall be thermal butt fusion molded fittings designation DR 11 with pressure rating of 160 pounds per square inch; except that 22½ degree bends may be fabricated fittings made of designation DR 9 HDPE pipe. Fittings for HDPE pipe 10 inches through 20 inches in diameter shall be thermal butt fusion fabricated fittings made of designation DR 9 HDPE pipe.

Electro fusion couplings, adapters and fittings shall be designation DR 11 or better and shall be installed according to the manufacturer's instructions.

Mechanical joint adapters shall be required for installation of mechanical joint valves, hydrants and metallic fittings. Mechanical joint adapters shall have same rating, material designation and standards equivalent to HDPE pipe. Mechanical joint adapters shall be equipped with stainless steel pipe stiffener insert, ductile iron gland ring, gasket and attachment bolts and nuts. Mechanical joint adapters shall be installed according to manufacturer's instructions.

Mechanical joints shall require SBR rubber gaskets.

Where joints cannot be made by thermal butt fusion or by mechanical joint adapter, mechanical joint restraint mechanism shall be required in conjunction with concrete thrust blocking at points of change in direction of flow. See Approved Products List for mechanical joint restraint mechanism 4 inch through 12 inch diameter pipe. Mechanical joint restraint mechanism shall have epoxy coating or approved equivalent. Hardware shall be coated with blue fluorocarbon coating, 304 stainless steel or approved equivalent.

Mechanical joint restraint mechanism shall require pipe stiffener of sufficient length to support full bearing length of restrainer and prevent toe-in of pipe end. Pipe stiffener shall be made of T-304 stainless steel, 8 inches long, with reinforcing wedge. Pipe stiffener shall match DR designation of pipe on which it is to be used, and shall be installed according to manufacturer's instructions.

Small taps 3/4 inch through 3 inch in diameter on HDPE pipe shall be accomplished by Electro fusion transition tapping saddles equipped with internal AWWA brass threads.

For connecting HDPE pipe to ductile iron pipe or PVC pipe, connection shall be made by an adapter kit which includes HDPE bell mechanical joint fitting with stainless steel reinforcing collar, C-110 heavy body ductile iron gland ring, gasket and extra length T-bolts. Installation shall be made with mechanical joint restraining mechanism for ductile iron or PVC pipe. Adapter kit shall be installed according to manufacturer's instructions.

Use of ductile iron and cast iron fittings in lieu of HDPE fittings requires prior approval from Project Manager.

S901-2.05 C909 Molecularly Oriented Polyvinyl Chloride (PVCO) Pipe and Fittings

PVCO pipe shall be designation pressure class 235 CIOD pipe in sizes 4 inches through 12 inches in diameter, blue in color. PVCO pipe is to be in conformance with requirements of AWWA C909 Standard for Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, for Water Distribution.

PVCO pipe shall be of good quality and strength and be homogenous throughout, with inside and outside surfaces being free of sticky or tacky material. PVCO pipe shall be free of blisters, cracks, cuts, foreign inclusions, holes, nicks, significant scratches, voids, and other defects that may affect overall integrity of PVCO pipe. PVCO pipe having any indication of cracking or crazing inside or outside shall be rejected. PVCO pipe shall be straight and true circle in section with concentric inner and outer surfaces. Joining surfaces of PVCO pipe spigots and integral-bell and sleeve-reinforced bell sockets shall be free of imperfections that might cause leakage at joints. PVCO pipe shall be manufactured to cast iron pipe equivalent outside diameters to allow direct connection into cast iron and ductile iron pipe and fittings.

Fittings for PVCO pipe sizes 4 inches through 12 inches in diameter shall be PVC injection molded fittings in conformance with requirements ANSI/AWWA C907.

Joints shall be SBR rubber gasket push-on type. When petroleum hydrocarbon or chlorinated solvent contaminated soils are encountered unexpectedly in the field, ductile iron pipe with nitrile gaskets or PVC pipe with nitrile gaskets shall be used in place of PVCO pipe.

Mechanical joint restraint mechanism shall be required in conjunction with concrete thrust blocking at points of change in direction of flow and at new hydrant branches.. Mechanical harness restraint shall be for push-on joints. Mechanical joint restraint mechanism shall have epoxy coating or approved equivalent. Hardware shall be coated with blue fluorocarbon coating, 304 stainless steel or approved equivalent. All mechanical joints on ductile iron fittings for PVCO water main shall require mechanical restraint.

Ductile iron or cast iron fittings will be allowed for connecting all PVCO water pipe sizes to existing metallic water pipe and when PVC fittings are not readily available. Non-epoxy coated ductile and cast iron fittings on PVCO water main are to be covered with protective wax tape coating.

S901-2.06 Petrolatum Wax Tape Coating System for Metallic Fittings to be used with Polyvinyl Chloride (PVC) Pipe, Molecularly Oriented Polyvinyl Chloride (PVCO) Pipe and High Density Polyethylene (HDPE) Pipe

The primer and wax tape coating shall be in accordance with ANSI/AWWA C217. Wax tape coating system shall be composed of synthetic fabric, saturated with blend of petroleum wax, plasticizers and corrosion inhibitors. Wax tape coating system shall consist of primer paste and petrolatum tape.

S901-2.07 Tracer Wire for Polyvinyl Chloride (PVC) Pipe, Molecularly Oriented Polyvinyl Chloride (PVCO) Pipe and High Density Polyethylene (HDPE) Pipe

Tracer wire shall be designed specifically for detecting buried utilities. Tracer wire for open cut installation shall be minimum of 12 AWG copper wire, solid, coated with a blue colored minimum 30 mil high molecular weight polyethylene insulation (HDPE or HMWPE). Tracer wire for trenchless water main shall consist of minimum (2) wires or as shown on plans and shall be minimum 12 AWG copper clad steel core wire, solid, with a blue 45 mil HDPE insulation.

S901-2.08 Tracer Wire Termination Box

Termination box shall be cathode protection test box. Termination box shall be 4 feet long, have shaft size of 4 inches inside diameter, body made of ABS plastic flared at bottom, with cast iron rim and flush fit drop-turn locking lid with words "WATER TEST" cast on top of lid. Non-conductive terminal board designed for minimum of two stainless steel terminal connections shall be attached to inside of lid.

If termination box is to be installed in paved area, termination box shall be installed within 7 inch diameter valve box. Valve box shall be minimum 4 feet long cast iron, screw type with arched base, with word "WATER" cast on top of lid.

S901-2.09 Impervious Clay Trench Plug

Impervious clay trench plug shall consist of a mixture of silt and clay soils free of rocks, stones and vegetation. All material shall pass through a 0.25 inch sieve and at least 95% by weight of the material shall pass through a #200 sieve. The hydraulic coefficient (coefficient of permeability) of the material shall be less than 1×10^{-6} cm/sec as measured using ASTM D5084.

S901-3 CONSTRUCTION DETAILS

S901-3.01 General

Water main pipe shall be installed in straight line horizontally and vertically. Deflection of water main pipe shall be achieved at pipe joints within manufacturer's allowable limits and with bend fittings. Water main pipe and fittings shall be handled in such manner that water main pipe and fittings, coatings and linings are not damaged. Nylon fabric choker sling capable of handling weight of water main pipe and fittings shall be used to lift, place and move water main pipe and fittings. Water main pipe and joints shall be uniformly supported and secured in place within required embedment material. Temporary support under water main pipe shall be removed upon securing water main pipe with permanent embedment material.

Refer to Section S900-3.02 for minimum cover over water main pipe and fittings, as measured between finished grade and top of water main pipe and fittings.

Minimum vertical separation between crossing water main and sewer pipe lines is to be 18 inches when water main pipe passes under sewer pipe, or 6 inches when water main pipe crosses over sewer pipe, as measured from outside of respective pipes at point of crossing. One full standard laying length of water main pipe is to be centered under or over sewer pipe so that both joints of water main pipe will be as far from sewer pipe as possible. In addition, when water main pipe passes under sewer pipe, adequate structural support in form of compacted crushed stone bedding or class K concrete is to be provided for sewer pipe to prevent excessive deflection of sewer pipe joints and any settling of sewer pipe onto water main pipe.

Optimum minimum horizontal separation between parallel water main and sewer pipes, including manholes, vaults and junction chambers, is 10 feet as measured from outside of respective pipes, manholes, vaults and junction chambers. In no case is water main pipe to be installed less than 3 feet horizontally from parallel sewer pipe, including manholes, vaults and junction chambers.

Where water main pipe has less than minimum separation requirements either horizontally or vertically, all of joints of water main pipe located within 10 feet of sewer pipe are to be encased with controlled density fill material. Controlled density fill encasement is to be placed to minimum thickness of 6 inches around water main pipe for minimum length of 2 feet as centered on joint of water main pipe.

In all cases, where water main pipe crosses another utility, vertical separation shall not be less than 6 inches.

Tees, bends, offsets, reducers, caps, plugs and hydrants on water pipe shall be mechanically restrained and solidly braced to prevent any movement due to thrust pressure. Bracing shall be accomplished with use of cast-in-place concrete between fittings/hydrant and undisturbed soil. Water valves shall be mechanically restrained at both ends.

Disinfection/sampling taps are to be installed no more than 1,000 feet apart and at ends of all new water main installations.

Contractor is responsible for making sure that inside of pipe is clean and free of foreign material before pipe installation.

S901-3.02 Ductile Iron Pipe and Fittings

Ductile iron pipe and fittings shall be installed in conformance with requirements of ANSI/AWWA C600, according to manufacturer's latest instructions, and as approved by Project Manager.

Polyethylene tube encasement shall be installed on all ductile iron water mains, water services and hydrant branch pipe in conformance with ANSI/AWWA C105/A21.5.

Plugging, filing, burning-in or welding will not be allowed to repair any ductile iron pipe or fittings that have been damaged.

For ductile iron pipe, sizes 4-inch through 24-inch in diameter, 75-90 ft/lbs is recommended torque on nuts and 'T' bolts used for mechanical joints.

Install magnesium anodes as shown on drawings and as approved by Project Manager.

The maximum allowable angular joint deflection for push-on Tyton Joint® ductile iron pipe shall be 4 degrees for 4 inch through 36 inch diameter. The maximum allowable angular joint deflection for mechanical joint ductile iron pipe and fittings shall be 6 degrees for 4 inch and 6 inch diameter, 4 degrees for 8 inch through 12 inch diameter, 3 degrees for 16 inch diameter and 2 degrees for 20 inch and 24 inch diameter.

Impervious clay trench plugs shall be installed around ductile iron pipe water mains and services where shown on the plans or as directed by the Project Manager to stop the flow of contaminated groundwater through porous water main bedding and backfill material.

S901-3.03 Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pipe and Fittings

PVC/PVCO pipe and fittings shall be installed in conformance with requirements of ANSI/AWWA C605, according to manufacturer's instructions, and as approved by Project Manager.

Field cutting of PVC/PVCO pipe shall be made with square ends. Cut spigot end shall be re-beveled at same angle provided by factory-finished PVC/PVCO pipe. On cut PVC/PVCO pipe an insertion line shall be marked on cut spigot end using factory marked spigot as guide. For connecting spigot end to shallow depth bell, such as mechanical joint valve and iron fitting, spigot end shall be cut so as to leave only slight bevel of 1/4 inch. Spigot end shall be inserted to full limit of shallow depth bell. For PVC (C900) pipe, sizes 4-inch through 24-inch in diameter, 75-90 ft/lbs is recommended torque on nuts and 'T' bolts used for mechanical joints. For PVCO (C909) pipe, 55 ft/lbs is recommended torque on nuts and 'T' bolts for mechanical joints.

In assembling PVC/PVCO pipe, gaskets and pipe ends shall be wiped clean and spigot end lubricated from beveled end to approximately mid-way from insertion line. If recommended by manufacturer, lubricant shall be applied inside bell, using lubricant that is supplied by manufacturer. Joining is complete when spigot end is inserted to insertion line. Care shall be taken not to over-insert spigot end into bell end. It is recommended newly laid pipe be partially backfilled before adding more pipe to minimize over-insertion of pipe joints on previously laid lengths of pipe. Joining shall not be made by use of heavy machinery.

The maximum allowable angular joint deflection for PVC/PVCO pipe and PVC fittings shall not exceed the manufacturer's published limits, which may be 1 degree or less.

Taps 2 inches in diameter and smaller on PVC/PVCO pipe shall require wide strap, all brass tapping saddles manufactured for C900 PVC pipe. Refer to Section S912, Corporation Stop and Connection, Taps larger than 2 inches in diameter on PVC/PVCO pipe shall require tapping sleeve. Taps shall be made using equipment designed specifically for making taps on PVC/PVCO pipe. Tap shall be no closer than 2 feet from back end of bell or spigot insertion line. Multiple taps shall be staggered at least 18 inches apart lengthwise.

Asphalt coated metallic fittings installed on PVC/PVCO water main including tapping assemblies and hardware, shall be coated with petrolatum wax tape coating system applied in conformance with manufacturer instructions.

One nine pound anode shall be attached to all ductile and cast iron fittings on PVC/PVCO water pipe.

Precast concrete cement blocks or any hard objects shall not be used for thrust blocking or directly supporting PVC/PVCO water pipe.

S901-3.04 High Density Polyethylene (HDPE) Pipe and Fittings

HDPE pipe and fittings shall be installed in conformance with manufacturer's instructions.

Field cutting of HDPE pipe shall be made with square ends.

Individual sections of HDPE water main pipe and fittings shall be joined together by thermal butt fusion method. Mechanical joining shall be used in locations where thermal butt fusion method cannot be used. Socket fusion, hot gas fusion, threading, solvent cements and adhesives such as epoxies shall not be used to join HDPE pipe.

Thermal butt fusion procedures shall be in conformance with manufacturer's instructions and Plastic Pipe Institute (PPI). Fusion equipment operator shall be trained and certified in recommended procedure. Contractor shall be responsible to verify that fusion equipment is in good operating condition and that operator has been properly trained. Thermal butt fusion equipment shall be capable of meeting all conditions recommended by manufacturer, including, but not limited to, temperature requirements of 400°F, alignment and an interfacial fusion pressure of 75 pounds per square inch. Butt fusion joining shall produce joint weld strength equal to or greater than tensile strength of HDPE pipe itself. Welds shall be

made using Data Logger to record temperature and fusion pressure with graphic representation of fusion cycle and shall be part of Quality Control records. Thermal butt fusion and Electro fusion joining methods shall be done in dry environment. Individual sections of HDPE pipe should be joined into continuous lengths on job site above ground. Fusion beads shall not be removed from HDPE pipe.

For installation of mechanical joint adapters, bolts shall be tightened and torqued in conformance with manufacturer instructions.

Asphalt coated metallic fittings installed on HDPE water main including tapping assemblies and hardware, shall be coated with petrolatum wax tape coating system applied in conformance with manufacturer instructions. Hardware for epoxy coated fittings not having blue fluorocarbon coating will require petrolatum wax tape coating system.

Directional drilling method of pipe installation shall require the Contractor to record with survey grade accuracy and provide As Built map of the horizontal location and depth of pipe in reference to project stationing.

Thermite weld 9 pound magnesium anode to each metallic fitting.

S901-3.05 Tracer Wire Installation with Polyvinyl Chloride (PVC) Pipe, Molecularly Oriented Polyvinyl Chloride (PVCO) Pipe and High Density Polyethylene (HDPE) Pipe

Tracer wire shall be installed along and above all PVC/PVCO/HDPE water pipe that is 4 inches in diameter and larger. Tracer wire shall be installed in such manner as to enable its detection with electronic locating equipment. Tracer wire shall be installed on top of PVC/PVCO/HDPE water pipe and shall be secured to water pipe with tape or plastic straps at 8 feet maximum intervals and at pipe bends. Tracer wire shall not be spiraled or otherwise wrapped around water pipe. At water service saddles, tracer wire shall be placed over and across water service saddle and water pipe. At valves, tracer wire shall be placed along the side of the water pipe so that the installation of a valve box will not damage the wire.

Tracer wire shall begin and terminate at all connections to existing metallic water pipes wherever possible. Tracer wire connections to existing metallic pipes shall be made with thermite weld. Thermite weld shall be completely sealed with a brush applied coats of an approved bitumastic coating specifically manufactured for underground use.

Route of tracer wire shall extend continuously along PVC/PVCO/HDPE water pipe, and shall be terminated at tracer wire termination box located near hydrant. Termination box shall be installed flush with finished grade and approximately 3 feet away from any given hydrant. Tracer wire shall extend up termination box and be connected to terminal board. Length of tracer wire extending up termination box shall be such that minimum of 3 feet of tracer wire can be coiled up and left tucked inside termination box.

Number of splices made on tracer wire shall be kept to minimum. Splices shall be made using an approved waterproof connector. Where polyethylene (PE) water services are installed with PVC/PVCO/HDPE water pipe, tracer wire for PE water service shall be spliced to tracer wire for PVC/PVCO/HDPE water main pipe, using an approved splice connector that slips over the main tracer wire without cutting it.

For directional drilling method of installing water main, Contractor shall attach tracer wire securely at beginning of pipe making sure wire will not become detached from pipe during drilling operation.

After installation of tracer wire on mains and services has been completed, the Contractor shall test the tracer wire for electrical continuity. Upon successful completion of system test and submission of certification form to the City, tracer wire system shall be checked for functionality by a representative of the Bureau of Water. Deficiencies in the tracer wire system shall be repaired by Contractor at no additional cost to the City, and the tracer wire system shall be retested by Contractor.

S901-3.06 Additional Fittings

If required, additional fittings shall be installed on new water main pipe that are not already shown in Contract Documents.

S901-3.07 Additional Concrete Thrust Blocks

If required, additional concrete thrust blocks shall be constructed that are not already shown to be constructed in Contract Documents.

S901-4 METHOD OF MEASUREMENT

S901-4.01 Water Main Pipe

Quantity to be measured for payment shall be number of linear feet of water main pipe installed as measured along centerline of water main pipe, beginning with face of hub forming commencement of new work and extending to face of hub or spigot constituting end of that particular line of water main pipe.

Hydrant branch water pipe and water service pipe 4 inches and larger will be measured and included for payment as water main pipe. Quantity to be measured for payment shall be number of linear feet of hydrant branch water pipe and water service pipe installed as measured from centerline of water main pipe to which hydrant branch water pipe and water service pipe is connected, along centerline of hydrant branch water pipe and water service pipe to face of hub or spigot constituting end of that particular hydrant branch water pipe and water service pipe line.

S901-4.02 Additional Fittings

Quantity to be measured for payment shall be number of pounds of additional fittings installed that were not originally required in Contract Documents. Weight of fittings shall be determined from listed weight in manufacturer catalogue.

S901-4.03 Additional Concrete Thrust Blocks

Quantity to be measured for payment shall be number of cubic yards of additional concrete thrust blocks installed that were not originally required in Contract Documents.

S901-5 BASIS OF PAYMENT

S901-5.01 General all Items

Unit price bid for all items shall include cost of: water pipe; water pipe fittings; water pipe specials; shop-drawings; hardware; warning tape; approved on site backfill; concrete thrust blocks; encasement; controlled density fill; joint materials; making water pipe joints; joint restraining devices; furnishing, installing and removing disinfection/sampling taps; blow-off taps; tapping saddles for disinfection/sampling taps and blow-off taps; pressure testing; disinfection, flushing and health sample testing and fees; pavement saw cutting; additional excavation and backfill required for testing and disinfection purposes; preparation and distribution of service interruption notices; preparation and submittal of water service information and cards; pipe installation records; and furnishing all labor, material and equipment necessary to complete work.

Unless provided for under separate payment items in Contract Documents, cost of furnishing, installing, maintaining, and removing temporary water pipes, valves, plugs, taps, corporation stops, curb stops and boxes, blow-off water pipes, and other fittings necessary for construction of new water main, or for providing continuous water service, shall be included in unit price bid for water main pipe.

Unless otherwise noted on plans or ordered by Project Manager, furnishing and installing magnesium anodes will be paid for under Section S966 Magnesium Anode.

Partial payment of eighty (80) percent of unit price bid will be made for installed water main pipe that has not satisfactorily passed pressure and health tests. Remaining twenty (20) percent will not be paid until water main installation has passed both pressure and health tests and has been accepted by Monroe County Health Department and City of Rochester

S901-5.02 Ductile Iron Pipe and Fittings

Unit price bid shall also include cost of: furnishing and installing ductile iron pipe, anchor pipe and fittings, polyethylene tube encasement, including adhesive tape and impervious clay trench plugs

S901-5.03 Polyvinyl Chloride (PVC), Molecularly Oriented Polyvinyl Chloride (PVCO) and High Density Polyethylene (HDPE) Pipe and Fittings

Unit price bid shall also include cost of: furnishing and installing PVC/PVCO pipe and fittings; ductile iron and cast iron fittings; tracer wire; tracer wire termination box; splices and connections; tracer wire testing and certification; and petrolatum wax tape coating of asphalt coated metallic fittings.

S901-5.04 Additional Fittings

Unit price bid shall also include cost of furnishing and installing additional pipe fittings, joint restraining devices and hardware.

S901-5.05 Additional Concrete Thrust Blocks

Unit price bid shall also include cost of furnishing and installing additional concrete thrust blocks.

Payment shall be unit price indicated in Contingent item list contained in Contract Documents.

No payment will be made for additional concrete that is necessary for constructing thrust blocks due to unnecessary over excavation of trenches beyond established payment limit lines.

S901-5.06 Excavation, Backfill and Surface Restoration

Excavation, rock excavation, furnishing and placing of bedding and select granular backfill (water), and surface restoration will be paid for under separate bid items. All hand or tunnel excavation in and around utility lines, tree roots, pipe joints and curbs shall be included in unit price bid for excavation.

No separate payment shall be made for placement of approved on site backfill material excavated from trench

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S901.0401XX	X" Ductile Iron Pipe Water Main Class 52	Linear Foot
S901.0503XX	X" Ductile Iron Pipe Class 52 for Hydrant Branch	Linear Foot
S901.0601XX	X" Ductile Iron Pipe Water Main Class 56	Linear Foot
S901.0603XX	X" Ductile Iron Pipe Class 56 for Hydrant Branch	Linear Foot
S901.07	Additional Ductile Iron Pipe Fittings	Pound
S901.0801XX	X" Polyvinyl Chloride Pipe Water Main	Linear Foot
S901.0802XX	X" Polyvinyl Chloride Pipe for Hydrant Branch	Linear Foot
S901.09	Additional Polyvinyl Chloride Pipe Injection Molded Fittings	Pound
S901.11XX	X" High Density Polyethylene Pipe Water Main	Linear Foot
S901.12	Additional High Density Polyethylene Pipe Fittings	Pound
S901.1301XX	X" Molecularly Oriented Polyvinyl Chloride Pipe Water Main	Linear Foot
S901.1302XX	X" Molecularly Oriented Polyvinyl Chloride Pipe for Hydrant Branch	Linear Foot
S901.15	Additional Concrete Thrust Blocks	Cubic Yard

REVISED February 13, 2014

SECTION S903 - RESILIENT SEAT GATE VALVE WITH VALVE BOX

S903-1 DESCRIPTION

Work consists of installation of resilient seat gate valve with valve box, as required in Contract Documents and as directed by Project Manager.

Work and materials are to be in conformance with requirements of Section S900 General Water Provisions and S901 Water Main Pipe and Fittings.

S903-2 MATERIALS

S903-2.01 Resilient Seat Gate Valve

Resilient seat gate valve is to have non-rising stem (NRS), O-ring stem seals, standard 2 inch square AWWA operating nut, and open right (clockwise). Resilient seat gate valve 12 inch diameter and smaller is to meet or exceed all requirements of ANSI/AWWA C509. Resilient seat gate valve 16 inch through 24 inch in diameter is to meet or exceed all requirements of ANSI/AWWA C515.

Resilient seat gate valve sizes 4 through 12 inch are to have design working pressure of 250 pounds per square inch and test pressure (gate open) of 500 pounds per square inch. Resilient seat gate valve sizes 16 through 24 inch are to have design working pressure of 200 pounds per square inch and test pressure of 500 pounds per square inch. Pressure rating is to be cast on outside of resilient seat gate valve body.

Resilient seat gate valve body, bonnet and gate for valves 4 through12 inch are to be cast iron or ductile iron. Valve body and bonnet for valves 16 through 24 inch are to be ductile iron with either cast iron or ductile iron gate. Interior and exterior surface of resilient seat gate valve body and bonnet are to be coated with fusion bonded epoxy in conformance with requirements of ANSI/AWWA C550.

Gate is to be completely encapsulated with rubber over all ferrous surfaces. Rubber is to be securely bonded to gate, including part which houses stem nut.

Resilient seat gate valve stem is to be made of high strength bronze having minimum tensile strength of 70,000 pounds per square inch and minimum yield strength of 32,000 pounds per square inch. Stem sealing is to utilize "O" ring seals which can be replaced while resilient seat gate valve is under pressure in both fully open and fully closed position.

Gate guides are to be provided to insure that gate is kept in proper alignment with body so that rubber sealing surfaces are evenly compressed when gate is closed to provide zero leakage at required design working pressure.

Resilient seat gate valve is to be designed so that during operation, or cycling of resilient seat gate valve, there is no friction, abrasion or rubbing together of gate and body that can wear away any rubber and epoxy, thus exposing bare metal.

Bolts and nuts for fastening bonnet to body of resilient seat gate valve are to be stainless steel.

Resilient seat gate valves 4 through 12 inch are to be vertical type. Unless otherwise specified, all resilient seat gate valves 16 inch and larger shall be horizontal type.

S903-2.02 Resilient Seat Gate Valve - Furnished

Resilient seat gate valve complete with valve box will be as furnished by Bureau of Water Materials and Equipment Section. Contractor is to pick-up complete resilient seat gate valve unit from Bureau of Water Materials and Equipment Section, 401 Dewey Avenue, Rochester, New York, (585) 428-7514. Bureau of Water Materials and Equipment Section requires a minimum of 2 working days advance notice to make arrangements for pick-up of complete resilient seat gate valve unit.

S903-2.03 Vertical Resilient Seat Gate Valve - Sizes 16 Inch to 24 Inch

Vertical resilient seat gate valve sizes 20 and 24 inch are to have 2:1 ratio enclosed low-profile spur gearing for buried service with AWWA 2 inch square operating nut to allow above ground operation through valve box.

Bolts and nuts on spur gear box are to be stainless steel.

Vertical resilient seat gate valves 16 inch and larger may only be used in locations where water main cover depths exceed 6 feet.

S903-2.04 Horizontal Resilient Seat Gate Valve

Horizontal resilient seat gate valves 16 inch and larger are to have 2:1 ratio right angle enclosed bevel gearing with AWWA 2 inch square operating nut to allow above ground operation through valve box.

Bolts and nuts on beveled gear box are to be stainless steel.

S903-2.05 Valve Box

Valve box is to be in conformance with material requirements of Section S909 Water Valve Box.

S903-3 CONSTRUCTION DETAILS

Resilient seat gate valve is to be installed with new water pipe in conformance with requirements of ANSI/AWWA C509 Appendix A, C515 Appendix A.

Resilient seat gate valve is to be inspected, cleaned and bolts and nuts checked for tightness before installation to ensure that it is in proper working order.

Vertical type resilient seat gate valve is to be installed with stem in vertical position. Horizontal type resilient seat gate valve is to be installed with valve stem in horizontal position and shaft of enclosed beveled gear box in vertical position.

Joints are to be watertight.

Valves, including mechanical joint glands, installed on metallic and non-metallic pipe shall be wrapped with polyethylene encasement and sealed with polyethylene tape.

Special attention is to be paid to backfill material placed under resilient seat gate valve to ensure that it is well compacted for bedding resilient seat gate valve.

Valve box is to be carefully set over stem or beveled gear shaft. Valve box is to be braced to ensure that it remains in proper vertical position and centered on valve stem during and after backfilling operation. Valve box top section is to be adjusted for elevation, and base centered over operating nut. Top of valve box is to be flush with finished surface. Backfilling of trench is to be done in manner so as to avoid damage to resilient seat gate valve and valve box.

Proper alignment and height of valve box is to be maintained until completion of Project.

S903-4 METHOD OF MEASUREMENT

Quantity to be measured for payment will be number of resilient seat gate valves, with valve box, installed.

S903-5 BASIS OF PAYMENT

S903-5.01 General All Items

Unit price bid includes cost of: enclosed beveled gear box; pressure testing; bracing; connection to water pipe; polyethylene wrap, maintaining proper alignment and height of valve box; pavement saw cutting; disinfection; and furnishing all labor, material and equipment necessary to complete work.

Excavation, rock excavation, furnishing and placing of bedding and backfill materials, and surface restoration will be paid for under separate bid items.

S903-5.02 Resilient Seat Gate Valve

Unit price bid also includes cost of furnishing and installing resilient seat gate valve complete with valve box.

S903-5.03 Resilient Seat Gate Valve - Furnished

Unit price bid also includes cost of picking-up and installing resilient seat gate valve complete with valve box.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S903.01XX	X" Resilient Seat Gate Valve with Valve Box - Vertical Type	Each
S903.02XX	X" Resilient Seat Gate Valve with Valve Box - Horizontal Type	Each
S903.03XX	X" Resilient Seat Gate Valve with Valve Box - Vertical Type (Furnished)	Each
S903.04XX	X" Resilient Seat Gate Valve with Valve Box - Horizontal Type (Furnished)	Each

REVISED September 23, 2010

SECTION S907 - CONNECT NEW WATER MAIN TO EXISTING WATER MAIN

S907-1 DESCRIPTION

Work consists of the connection of a new water main to an existing water main as required in the Contract Documents and as directed by the Project Manager.

Work and materials are to be in conformance with requirements of Sections S900 General Water Provisions and S901 Water Main Pipe and Fittings.

S907-2 MATERIALS

All fittings and joint connection materials required to make the connection shall be as approved by the Project Manager prior to installation. Generally, the fittings and connection materials shall be the same material as the existing pipe: ductile iron fittings shall be required when connecting new ductile iron or PVC/PVCO pipe to existing cast or ductile iron pipe; and injection molded PVC fittings shall be required when connecting new PVC/PVCO pipe to existing PVC/PVCO pipe that is 12 inch diameter or less.

S907-3 CONSTRUCTION DETAILS

New water main shall be connected to the existing water main using approved and appropriate gaskets, materials and fittings. Fit between the new water main and the existing water main shall not exceed a gap of 1/8 inch.

The interior of all water main pipe and fittings not receiving 24 hour chlorine disinfection contact time must be spray or swab disinfected with a 1 to 5 percent solution of chlorine no more than 30 minutes prior to installation. The interior and exterior of cut ends of existing pipe shall also be cleaned and disinfected.

All fittings shall be solidly braced against the trench wall to prevent any deflection due to thrust pressure. Bracing shall be accomplished by the use of cast-in-place concrete thrust blocks and restrained joints.

All water pipe joints shall be made watertight. Prior to backfilling, the water main shall be filled with potable water and installation tested for leaks under line pressure in the presence of the Project Manager.

Prior to backfilling, uncoated tie rods, clamps and any components made of metal used for restrained joints are to receive hand brushed application of an approved bitumastic coating specifically manufactured for underground use or petrolatum wax tape coating system.

Non epoxy coated ductile iron fittings installed on PVC/PVCO water main pipe shall be coated with petrolatum wax tape coating system applied in conformance with manufacturer's instructions. One nine pound anode shall be attached to each ductile iron fitting.

When connecting a new ductile iron or PVC/PVCO water main to an existing cast or ductile iron water main, one 32 pound anode shall be thermite welded to the existing water main.

S907-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of connections actually made.

S907-5 BASIS OF PAYMENT

The unit price bid shall include the cost of: cutting and removing a piece of the existing water main; removing the existing plug; dewatering and cleaning existing water main; furnishing and using all temporary plugs; disinfectant to prevent contamination of the existing water main; connecting the new water main to the existing water main; furnishing and placing all pipe, pipe specials, gaskets, fittings, joints, hardware and thrust blocks; protective coating; restrained joints; plugging the abandoned water main with concrete; pavement saw cutting; leak testing; and furnishing all labor, material and equipment necessary to complete the work.

Excavation, rock excavation, furnishing and placing of magnesium anodes, bedding and select granular backfill, and surface restoration will be paid for under separate bid items.

Payment for installation of a tee or cross into existing water main shall be considered as one connection.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S907.01	Connect New Water Main to Existing Water Main	Each

REVISED February 13, 2014

SECTION S909 - WATER VALVE BOX

S909-1 DESCRIPTION

The work shall consist of the installation of a new water valve box assembly, removal or adjustment of existing water valve box or installation of new water valve box top section and lid as required in the Contract Documents and as directed by the Project Manager.

The work shall be in conformance with the requirements of Section S900 General Water Provisions.

S909-2 MATERIALS

S909-2.01 Water Valve Box

Water valve box shall be two piece Buffalo Style, 5-1/4 inch shaft, cast iron boxes with a slip type extension with flange at top of upper section (2-3 inches from top).

S909-2.02 Adjustment Ring

Adjustment ring shall be cast iron and capable of fitting on Buffalo style water valve box, and be in 1 inch increments.

S909-2.03 Water Valve Box Top Section

Replacement water valve box top section and lid shall be cast iron with flange at top, Buffalo Style.

S909-2.04 Water Valve Box (Pitometer)

Water valve box for pitometer shall be three piece Buffalo Style screw type, 7 inch diameter, with cast iron shaft.

S909-3 CONSTRUCTION DETAILS

S909-3.01 General

Prior to adjusting or installing water valve box on water valve which is to remain in service, water valve shall be operated by the Bureau of Water to insure that it is functioning properly. A water valve that does not function properly shall be replaced only as approved by the Project Manager. Water valves are to be operated only by authorized representatives of the Bureau of Water.

S909-3.02 Installation

An existing water valve box that is found damaged, not of sufficient length to be raised to the required finished grade, or determined by the Bureau of Water to be in need of replacement, shall be removed and replaced with a new water valve box assembly.

Water valve box shall be carefully set over the stem. Top section shall be adjustable for elevation, and the base centered over the operating nut. Water valve box shall be carefully set and braced to insure that it remains in a vertical position centered on the stem during and after backfilling. Proper alignment and height of water valve box shall be maintained, until completion of the Project. Top of the water valve box shall be flush with the finished grade. Backfilling of the trench shall be done in a manner so as to avoid damage to the water valve and water valve box.

Upon completion of the work, the excavation shall be backfilled and the surface area restored.

S909-3.03 Removal of Existing Water Valve Box Assembly

Existing water valve box on abandoned water valve shall be removed to a minimum of 18 inches below the finished grade.

S909-3.04 Installation of New Water Valve Box Assembly

Existing water valve box shall be removed and a new water valve box assembly installed. New water valve box shall be carefully set over the existing stem, the base centered over the operating nut and the top section adjusted for elevation.

S909-3.05 Replacement of Water Valve Box Top Section

A sufficient area shall be excavated to enable the upper section of the water valve box to be removed. No debris shall be allowed to fall into the existing water valve box. New top section shall be carefully set over the existing bottom section and adjusted to the proper elevation.

S909-3.06 Water Valve Box Adjustment

A. Water Valve Box Adjustment with Cast Iron Rings

Prior to resurfacing of a pavement surface, the top elevation of an existing water valve box shall be adjusted to finished grade by adding or removing cast iron adjustment rings. Cast iron rings required to raise water valve box other than the Buffalo Style shall be provided by the Bureau of Water. Bureau of Water shall be notified 2 working days in advance when adjustment rings are required for adjustment. Adjustment ring shall be secured into the existing water valve box with a fast setting adhesive. Adhesive shall be two-part epoxy, ET500 as manufactured by Permabond, or approved equivalent.

B. Water Valve Box Adjustment with Slip or Screw Type Extensions

Existing water valve box shall be raised or lowered to the finished grade. Prior to adjustment, the water valve box shall be checked for proper alignment. If a water valve box is found to be out of alignment, the Project Manager shall be notified immediately.

Flanges on existing water valve box sections are not to be broken to facilitate adjustment.

S909-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of water valve boxes actually installed, removed, or adjusted.

S909-5 BASIS OF PAYMENT

S909-5.01 General all Items

The unit price bid for all items shall include the cost of: furnishing and installing new water valve box assemblies or cast iron adjustment rings; having existing water valves checked; removal and disposal of existing water valve boxes; adjustment of new or existing water valve boxes to finished grade and alignment; pavement saw cutting; and furnishing all labor, material and equipment necessary to complete the work.

S909-5.02 Remove Existing Water Valve Box

Separate payment for removal of water valve box will be made only if water valve box is permanently removed and not replaced and only if water valve box is located outside of pavement reconstruction or trench and culvert excavation area, and only if removal of the water valve box is not being done in conjunction with salvaging of an existing valve or removal of an existing hydrant.

Payment for those water valve boxes permanently removed that are located in pavement trench and culvert excavation area, or are removed in conjunction with salvaging of an existing water valve, or removal of an existing hydrant, will be included in unit price bid for Items 203.02 Unclassified Excavation and Disposal, R206.04 Trench and Culvert Excavation, S902.03XX Salvage Existing Water Valve, or S917.05 Remove Existing Hydrant.

S909-5.03 Water Valve Box Adjustment with Cast Iron Rings

The unit price bid shall also include the cost of furnishing and installing cast iron adjustment rings up to a total thickness of 6 inches and adhesive.

S909-5.04 Water Valve Box Adjustment with Cast Iron Rings Furnished by Bureau of Water and Lighting

The unit price bid shall also include the cost of installing cast iron adjustment rings up to a total thickness of 6 inches. Adjustment rings shall be obtained from the Bureau of Water Materials and Equipment Section. Adhesive shall be furnished by Contractor.

S909-5.05 Replacement of Water Valve Box Top Section

The unit price bid shall also include the cost of: removal of existing water valve top sections and lids; furnishing and installing new water valve box top sections and lids.

S909-5.06 Excavation, Backfill and Surface Restoration

Excavation, furnishing and placing of select granular backfill and surface restoration will be paid for under separate bid items or included in the price bid for the items as indicated in the payment item description.

Excavation that is included in the pay item does not include rock excavation. Rock excavation will be paid for under separate bid item.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S909.01	Furnish and Install New Water Valve Box	Each
S909.02	Furnish and Install New Water Valve Box (Including Excavation and Backfill)	Each
S909.03	Furnish and Install New Water Valve Box (Including Excavation, Backfill and Surface Restoration)	Each
S909.04	Remove Existing Water Valve Box	Each
S909.05	Remove Existing Water Valve Box (Including Excavation and Backfill)	Each
S909.06	Remove Existing Water Valve Box (Including Excavation, Backfill and Surface Restoration)	Each
S909.07	Adjust Existing Water Valve Box to Grade - Extension Adjustment	Each
S909.08	Adjust Existing Water Valve Box to Grade - Extension Adjustment (Including Excavation and Backfill)	Each
S909.09	Adjust Existing Water Valve Box to Grade - Extension Adjustment (Including Excavation, Backfill and Surface Restoration)	Each
S909.10	Adjust Existing Water Valve Box to Grade with Adjustment Rings	Each
S909.11	Adjust Existing Water Valve Box to Grade with Adjustment Rings (Furnished)	Each
S909.12	Replace Existing Water Valve Box Top Section	Each
S909.13	Replace Existing Water Valve Box Top Section (Including Excavation and Backfill)	Each
S909.14	Replace Existing Water Valve Box Top Section (Including Excavation, Backfill and Surface Restoration)	Each
S909.1501	Furnish and Install New Water Valve Box (Pitometer)	Each

ITEM NO.	ITEM	PAY UNIT
S909.1502	Furnish and Install New Water Valve Box (Pitometer) (Including Excavation and Backfill)	Each
S909.1503	Furnish and Install New Water Valve Box (Pitometer) (Including Excavation, Backfill and Surface Restoration)	Each
S909.1601	Replace Existing Water Valve Box Top Section (Pitometer)	Each
S909.1602	Replace Existing Water Valve Box Top Section (Pitometer) (Including Excavation and Backfill)	Each
S909.1603	Replace Existing Water Valve Box Top Section (Pitometer) (Including Excavation, Backfill and Surface Restoration)	Each

REVISED February 13, 2014

SECTION S970 – HOSE BIBB ASSEMBLY

S970-1 DESCRIPTION

Work consists of providing a hose bibb assembly as required in the Contract Documents and as directed by the Project Manager.

Work is to be in conformance with the requirements of Section S900 General Water Provisions and Section S901 Water Main Pipe and Fittings.

S970-2 MATERIALS

S970-2.01 Hose Bibb

Hose bibb shall be bronze body with replaceable bronze seat, 3/4-inch, NPS threaded supply connection, NPS male threaded hose nozzle outlet, wheel operating handle, and capable of operating at working pressures up to 125 p.s.i.

S970-2.02 Supply Piping

Schedule 80 PVC pipe and fittings with solvent weld joints. Provide threaded joints where indicated on the Contract Documents.

High density polyethylene pipe, DR17, in accordance with Section S901 Water Main Pipe and Fittings.

SDR ?

S970-2.03 Support Post

MCA pressure treated, yellow pine timber.

S970-2.04 Support Straps

Type 316 stainless steel straps and hardware.

S970-2.05 Concrete Anchor Block

Minimum 4,000 psi concrete in accordance with Section S504 Portland Cement Concrete.

S970-2.06 Bedding and Backfill

S203 FOR SAND AND SGF (WATER)

Materials in accordance with Section S900 General Water Provisions, Section S901 Water Main Pipe and Fittings, and other requirements of the Contract Documents.

S970-2.07 Precast Concrete Splash Block

Minimum 4,000 psi concrete in accordance with Section S504 Portland Cement Concrete, precast to dimensions indicated on Contract Documents.

S970-3 CONSTRUCTION DETAILS

(R206) City Spec?

Excavation and backfill shall be performed in accordance with Section S206 – Trench and Structure Excavation.

Hose bibb assembly shall be installed in accordance with manufacturer's specifications and as specified in

the Contract Documents. The nozzle shall be located 42-inches above finished grade. Provide length of support post as required to meet dimensions indicated on the Contract Documents. ~~Piping shall be installed as specified in Section S900 General Water Provisions and Section S901 Water Main Pipe and Fittings.~~

Locate hose bibb assemblies 5-feet from the edge of pavement or as indicated by the Project Manager. Confirm location of all hose bibb assemblies with the Project Manager prior to installation.

Overall installation shall be tested for leaks under line pressure in the presence of the Project Manager prior to backfilling, and all connections made watertight and free from leakage.

Hose bibb assembly shall be carefully set and braced to insure that it remains in a vertical position during and after backfilling. Excavation shall be backfilled and disturbed surface area restored.

S970-4 METHOD O MEASUREMENT

Quantity to be measured for payment will be number of hose bibb assemblies installed, and the number of linear feet of hose bibb supply piping installed.

S970-5 BASIS O PAYMENT

S970-5.01 Hose Bibb Asse bly

Unit price bid includes cost of excavating furnishing and installing hose bibb assembly including above grade and buried supply piping to a distance of five feet from the hose bibb connecting supply piping to existing water main, existing supply pipe, or new water main restrained transition coupling concrete anchor block support post and straps bedding backfill including select granular backfill as required and furnishing all labor, material and equipment necessary to complete the work.

Restoration will be paid for under separate bid items.

S970-5.02 Re o e and Replace E isting Hose Bibb Asse bly

Unit price bid includes items specified in S970-5.01 Hose ibb Assembly and removal of the existing hose bibb assembly as indicated on the Contract Documents, including any additional excavation, backfill, and select granular backfill that is required.

S970-5.03 1 HDPE Hose Bibb Supply Piping

Unit price bid includes cost of excavating furnishing and installing 1-inch diameter DR17 HDPE buried hose bibb supply piping beyond a distance of 5 linear feet from the hose bibb restrained couplings and fittings bedding and backfill including select granular backfill as required and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under

ITEM NO.	ITEM	PAY UNIT
S980.01	Hose ibb Assembly	Each
S980.02	Remove and Replace Existing Hose ibb Assembly	Each
S980.03	1 Hose ibb Supply Piping	F

SECTION S9□0 – OUTLET STRUCTURES

S9□0-1 DESCRIPTION

Work consists of providing precast concrete outlet structures as required in the Contract Documents and as directed by the Project Manager.

S9□0-2 MATERIALS

S9□0-2.01 □eneral

ASTM C 478 precast, reinforced concrete, of depth indicated on Contract Documents, with provision for sealant joints. □ase section shall be 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor. Riser sections shall be 4-inch minimum thickness, and lengths to provide depth indicated. Top section shall be flat-slab-top type, 4-inch minimum thickness, of size that matches grade rings.

Adjusting/grade rings shall be interlocking rings with level or sloped edge in thickness and shape matching catch basin frame and grate. □nclude sealant recommended by manufacturer. Provide as required for specified depth indicated.

S9□0-2.02 Reinforced Concrete

Concrete shall be minimum 4,000 psi in accordance with Section S504 Portland Cement Concrete. □ar reinforcement shall be in accordance with N□SD□T Section 709-1 □ar Reinforcement, Grade 60.

S9□0-2.03 □oint Sealant

ASTM C 990 bitumen or butyl rubber.

S9□0-2.04 Pipe Connectors

ASTM C 923, resilient, of size required, for each pipe connecting to base section.

S9□0-2.05 □ra□es and □rates

ASTM A 536, Grade 60-40-18, ductile iron designed for A-16, structural loading. Size shall be 24 by 24 inches minimum unless otherwise indicated. Grate free area shall be approximately 50 percent unless otherwise indicated.

S9□0-2.06 Da□pproofing

Dampproofing material for exterior portion of outlet structure shall be two coats of Hi-□uild □ituminous Coating 35-□-10 as manufactured by Mobil Corporation, or □oppers □itumastic Super □lack as manufactured by □oppers Company, □nc., or approved equivalent.

Dampproofing material for interior portion of outlet structure shall be two coats of Tamms Duralkote 240 as manufactured by Dural □nternational Corporation, or approved equivalent.

S9□0-2.07 Trash Rack

ASTM A-36 steel, hot-dip galvanized after fabrication. Anchors shall be galvanized expansion type concrete anchors.

S9□0-3 CONSTRUCTION DETAILS

Excavation and backfill shall be performed in accordance with Section S206 – Trench and Structure Excavation.

Frame and grate shall be installed true to line and grade. Suitable measures are to be taken to ensure that grate has continuous, full and uniform bearing contact with corresponding frame. Grate is to be non-rocking when in place and under the influence of traffic or other loads.

All pipe openings shall be cored or cast-in-place by the manufacturer. Rough openings provided by jackhammering or other similar measures are not allowed.

□nterior and exterior surfaces of outlet structures are to be dampproofed, cleaned, and kept cleaned until final acceptance of work. Exterior surfaces of outlet structures that are exposed to view shall not receive exterior dampproofing.

S9□0-4 METHOD O□ MEASUREMENT

□uantity to be measured for payment will be lump sum for each of the specified outlet structures installed.

S9□0-5 BASIS O□ PAYMENT

S9□0-5.01 □eneral

□nit price bid includes cost of□excavating□furnishing and installing outlet structure□connecting sewer and underdrain piping□trash rack□backfill□and furnishing all labor, material and equipment necessary to complete the work.

Stone bedding, geotextile stabilization, and restoration will be paid for under separate bid items.

Payment will be made under□

ITEM NO.	ITEM	PAY UNIT
S980.01	Willow Pond □utlet Structure □S-1	□ump Sum
S980.02	□ioretention Area No. 1 □utlet Structure □S-2	□ump Sum
S980.03	□ioretention Area No. 2 □utlet Structure □S-3	□ump Sum

SECTION S9□1 – CLEANIN□ AND □LUSHIN□ SE□ ERS

S9□1-1 DESCRIPTION

Work consists of cleaning and flushing existing sewers as required in the Contract Documents and as directed by the Project Manager.

S9□1-2 MATERIALS □Not Used□S9□1-3 CONSTRUCTION DETAILS

S9□1-3.01 □eneral

The cleaning shall be accomplished with high velocity jet hydro cleaning equipment. No mechanical bucket machinery will be acceptable for the cleaning process. The term □clean□as used in these specifications, shall be defined as removing sufficient material to the satisfaction of the Project Manager. The sewer line shall be free from roots or other agents.

High velocity jet hydro cleaning equipment shall be capable of producing flows from a fine spray to solid stream and shall have a selection of two or more high pressure nozzles □approximately 2,000 psi□ The nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned. Equipment shall also include a high velocity gun for washing and scouring manhole walls and floor. The equipment shall carry its own water tank, auxiliary engines, pumps and hydraulically driven hose reel.

Satisfactory precautions shall be taken to protect the sewer lines at all times. Precautions shall be taken so that the water pressure created does not damage or cause flooding of public or private property being served by the sewer. Contractor's personnel shall be experienced and skilled in the use of the equipment used.

The equipment and methods selected shall be in accordance with the National Association of Sewer Service Companies □NASSC□□ Recommendation. The equipment shall be capable of removing dirt, grease, roots, rocks, sand, and other materials and obstructions from the sewer lines and structures □f cleaning of an entire section cannot be successfully performed from a single structure or opening, the equipment shall be set up on the other structure or opening, or additional openings in the pipe shall be provided as required, and cleaning again attempted. □f, again, successful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, the equipment should be checked for performance. □f the equipment is found to perform to standards, it will be assumed that a major blockage exists and the cleaning shall be abandoned.

All sludge, dirt, sand, rocks, grease, roots and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream end of the section being cleaned. Passing material from structure to structure, which would cause line stoppages, shall not be permitted. All sludge, dirt, sand, gravel, roots, grease and other debris resulting from the cleaning operation shall be the property of the Contractor and shall be disposed off site. The Contractor shall use suitable vacuum equipment so that no solids are permitted to go downstream. All materials shall be removed from the site no less often than the end of each work day. □nder no circumstances will the Contractor be allowed to accumulate debris, etc., on the site of work beyond the stated time.

Acceptance of sewer line cleaning shall be made upon the successful completion of the television inspection and acceptance by the Project Manager. □f television inspection shows the cleaning to be unsatisfactory, the Contractor shall be required to reclean and reinspect the sewer line until the cleaning is shown to be satisfactory.

Excavation and backfill shall be performed in accordance with Section S206 – Trench and Structure
Excavation.

S9□1-3.02 Tele□ision Inspection

All□cleaned and flushed sewers shall be inspected using closed circuit television. The inspection shall be done one section at a time and the section being inspected shall be suitably isolated from the remainder of the sewer line as required. T0he television camera used for the inspection shall be one specifically designed and constructed for sewer inspection. □ighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera shall be operative in 100 percent humidity conditions and have a minimum of 600 line-resolutions. Picture quality and definition shall be to the complete satisfaction of the Engineer and, if unsatisfactory, the equipment shall be removed and replaced with equipment of satisfactory quality.

The camera shall be moved through the line in either direction at a uniform slow rate by means of cable winches located at manholes or pipe openings on each side of section being televised. Telephone or other suitable means of communications shall be set up between the two winches and the monitor control.

□f the camera should tip over during the inspection, it shall be taken out, realigned, and the line section shall be re-televised. Television inspection shall be performed only when one hundred percent of the flow, excluding infiltration and inflow within that section, is diverted away from the section being televised.

S9□1-3.03 Clean Up and □inal Acceptance

The Contractor shall be responsible for the disposal of excess material and general clean-up of the work area, which will be subject to the approval of the Project Manager.

Final acceptance of the sewer line cleaning shall be made upon completion of the television inspection and shall be to the entire satisfaction of the Project Manager.

S9□1-4 METHOD O□ MEASUREMENT

□uantity to be measured for payment will be the linear foot of sewer cleaned and flushed to the acceptance of the Project Manager as measured horizontally in plan view.

S9□1-5 BASIS O□ PAYMENT S9□1-5.01 Hose Bibb Asse□ bly
□nit price bid includes cost of□verifying location of existing sewer and outfall□cleaning and flushing existing sewer pipe□disposal of removed material□providing all required openings in existing pipe for access including cutting pipe, excavation, bedding, backfill, and replacement of removed section of pipe□television inspection□protection of existing sewer□restoration□and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under□

ITEM NO.	ITEM	PAY UNIT
S981.01	Cleaning and Flushing Existing Sewer	

CREATED □une 9, 2015

SECTION S999 - PROJECT SIGN

S999 GENERAL

It is responsibility of Contractor to provide project signs for duration of Project. Project signs are to be installed prior to any construction work being performed by Contractor on behalf of City of Rochester.

S999-1 DESCRIPTION

Work consists of furnishing and installing project signs as required in Contract Documents and as directed by Project Manager.

Project signs must be installed at all main access points to project site. Project signs are not required to be installed at other minor access points, unless otherwise specifically required in Contract Documents. Actual number of signs to be installed on project will as indicated in Contract Documents.

For purposes of this specification, all references are in accordance with *NYSDOT Standard Specifications (US Customary Units dated May 1, 2008)* edition, including any addenda.

S999-2 MATERIALS

S999-2.01 Project Sign 6 4 and 3 2

Sign board is to be constructed from 3/4 inch thick duraply or A-A exterior grade plywood. Sign board is to be painted with two coats of white exterior enamel paint. Lettering and City mark are to be done with one color, pms 287C blue.

Lettering and City mark are to be done by either silk screen process, die cut vinyl letters (permanent adhesive), hand lettering, or stencil.

S999-2.02 Project Sign 11 17

Sign board is to be constructed of white poster board or other cardboard material suitable for minimum life span of 14 days. Lettering and City mark are to be done with one color, pms 287C blue.

Lettering and City mark are to be done by either silk screen process, die cut vinyl letters (permanent adhesive), hand lettering, or stencil.

S999-2.03 Project Sign - Inter-governmental

Sign board is to be 6 feet by 1 foot 3 inches, and constructed from 3/4 inch thick duraply or A-A exterior grade plywood. Sign board is to be painted with two coats of white exterior enamel paint. Lettering and logos will be as required by appropriate governmental agency.

Lettering and logos are to be done by either silk screen process, die cut vinyl letters (permanent adhesive), hand lettering, or stencil.

S999-3 CONSTRUCTION DETAILS

S999-3.01 Project Sign Information and Approval

Prior to fabrication of actual project sign, mock-up of proposed project sign must be submitted to City for approval.

Project Manager will supply Contractor with any updates to information that is required to be displayed on project sign for preparation of mock-up of proposed project sign.

Mock-up of proposed project sign must be submitted to City's Graphic Design Section for solicitation of comments, and any required revisions must be made before approval of proposed project sign layout will be given. Contractor is to contact City's Graphic Design Section, Monday through Friday, between hours of 9:00AM and 5:00PM, (585) 428-6068.

Contractor must obtain written confirmation from City's Graphic Design Section that proposed project sign layout has been approved, and provide copy of such written approval to Project Manager, prior to fabrication and installation of project sign.

S999-3.02 General

Project signs must be in place minimum of 2 days before Contractor commences any form of work on project site, and are to remain in place for minimum of 5 days after completion of project. Contractor is to maintain project signs in good condition for duration of project.

Under no circumstances are project signs from one project to be altered for re-use on another project. Project signs are property of City of Rochester, and after completion of project, project signs are to be removed and destroyed, or delivered to City storage facility, as directed Project Manager.

On occasion, project signs may be required to be relocated from one area of project site, to another area of project site. When project sign is relocated, it is to be re-installed using installation requirements as outlined under this specification.

For those projects that are spread out over several different streets and require generic project signs, number of actual project signs required may be less than total number of individual locations. Examples of such type of project would be: *Water Main Cleaning and Lining Project*, *Milling and Resurfacing Project*, or *Sidewalk Curb Ramp Improvement Project*. As work is completed and progresses from one location to another, project signs will be required to be relocated from original installation site to new work site.

For project signs made out of plywood, two coats of white exterior enamel paint are to be applied evenly to both sides and on all edges of sign board. Fastening devices that appear on face of project sign are to be painted to match background color. No fastening devices are to enter into or cover any area of lettering or artwork.

Project signs are to be soundly constructed and securely mounted on their own posts or barricades. Generally, project signs are not to be mounted on buildings, walls, fences, utility poles, traffic sign posts, or trees. Only 11 inch by 17 inch size project signs may be mounted on utility poles and trees. Project signs are to be located such as to be easily noticed, but are not to impair in any way or manner visual sight distance of both vehicular and pedestrian traffic.

Where required to be installed, inter-governmental project sign is to be placed directly above City's standard project sign.

Bottom of sign board is to be posted minimum of 5 feet above grade.

S999-3.03 Artwork

Sample layout of project sign has been included in Contract Documents. Layout shows position of City mark and type of information that is to be on project sign, and how project sign is to look once it has been manufactured.

If screen printing, Contractor is to supply all screens.

If required by Contractor, City's Graphic Design Section will provide camera-ready artwork for City mark only. Camera-ready artwork for City mark will be provided in high resolution digital file format which can be e-mailed to Contractor, or Contractor's representative. No camera-ready artwork will be provided for any other information that is to be on project sign.

For camera-ready artwork and for any additional information regarding City mark, Contractor is to contact City's Graphic Design Section, Monday through Friday, between hours of 9:00AM and 5:00PM, (585) 428-6068.

S999-4 METHOD O□ MEASUREMENT

Quantity to be measured for payment will be number of project signs furnished and installed.

S999-5 BASIS O□ PAYMENT

Unit price bid includes cost of: preparing mock-up; obtaining approvals; constructing, furnishing, installing, relocating, maintaining, and removing project signs and posts/barricades; destroying or delivering project signs to City storage facility after completion of work; and furnishing all labor, material and equipment necessary to complete work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S999.0101	Project Sign - 6' x 4'	Each
S999.0201	Project Sign - 3' x 2'	Each
S999.0301	Project Sign - 11" x 17"	Each
S999.04	Project Sign - Inter-governmental	Each

REVISED March 3, 2015